

NATIONAL HISTORIC LANDMARK NOMINATION

NPS Form 10-900

USDI/NPS NRHP Registration Form (Rev. 8-86)

OMB No. 1024-0018

MUD LAKE CANAL

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United States Department of the Interior, National Park Service

National Register of Historic Places Registration Form

1. NAME OF PROPERTY

Historic Name: Mud Lake Canal

Other Name/Site Number: Bear Lake Canal/Bear Lake Archeological District/EVER-192/8MO32

2. LOCATION

Street & Number: Everglades National Park

Not for publication: N/A

City/Town: Flamingo

Vicinity: X

State: Florida

County: Monroe

Code: 087

Zip Code: 33034

3. CLASSIFICATION

Ownership of Property

Private:

Public-Local:

Public-State:

Public-Federal: X

Category of Property

Building(s):

District:

Site: X

Structure:

Object:

Number of Resources within Property

Contributing

1

1

Noncontributing

 buildings

 sites

3 structures

 objects

3 Total

Number of Contributing Resources Previously Listed in the National Register: 1

Name of Related Multiple Property Listing: Archaeological Resources of Everglades National Park MPS

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4. STATE/FEDERAL AGENCY CERTIFICATION

As the designated authority under the National Historic Preservation Act of 1966, as amended, I hereby certify that this ____ nomination ____ request for determination of eligibility meets the documentation standards for registering properties in the National Register of Historic Places and meets the procedural and professional requirements set forth in 36 CFR Part 60. In my opinion, the property ____ meets ____ does not meet the National Register Criteria.

Signature of Certifying Official

Date

State or Federal Agency and Bureau

In my opinion, the property ____ meets ____ does not meet the National Register criteria.

Signature of Commenting or Other Official

Date

State or Federal Agency and Bureau

5. NATIONAL PARK SERVICE CERTIFICATION

I hereby certify that this property is:

☐ Entered in the National Register☐ Determined eligible for the National Register☐ Determined not eligible for the National Register☐ Removed from the National Register☐ Other (explain): _____

Signature of Keeper

Date of Action

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6. FUNCTION OR USEHistoric: TRANSPORTATION
COMMERCE/TRADESub: Water-related
Trade(Archeology)

Current: LANDSCAPE

Sub: National Park

7. DESCRIPTION

Architectural Classification: N/A

Materials:

Foundation:

Walls:

Roof:

Other:

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Describe Present and Historic Physical Appearance**SUMMARY**

The Mud Lake Canal (8MO32) is an aboriginal canal as described in Section F8.1 of the National Historic Landmarks Theme Study, *Southern Florida Sites Associated with Tequesta and their Ancestors* (Florida Division of Historical Resources 2004). The property is nationally significant under National Historic Landmark Criteria 4 and 6. Under Criterion 4 the Mud Lake Canal is significant because it is the best preserved example of a rare prehistoric engineering feat—a long-distance canoe canal. The Mud Lake Canal meets Criterion 6 because the property is a rare and well-preserved example of an aboriginal canoe canal, a type of site that is unique to Florida and the Southeast in terms of North American prehistory and archeology.

The canal is located on Cape Sable, at the southernmost extremity of mainland Florida (see Figures 1 and 2). The canal was first recognized by several early twentieth century visitors to the Cape Sable area, including eminent physical anthropologist Aleš Hrdlička (1922:47) and botanist John Kunkel Small (1924:82, 1929:54-55). Archeologist John Goggin (n.d.:185-186), writing in his unpublished typescript on the archeology of southern Florida, described the canal in 1950, noting that it is 20 to 30-feet wide and 1 to 2-feet deep. Like other long distance canoe canals in Florida, the Mud Lake Canal was dug by American Indians and may have been designed to provide safe passage, easy access to aquatic resources, and courses for exchange or tribute (see Luer 1989; Wheeler 1995). An AMS radiocarbon date suggests that the canal dates to at least the Glades IIIa Period (ca. 750-550 B.P. [ca. A.D. 1200-1400]). This is consistent with occupation of the associated Bear Lake Mound group (8MO33, 8MO34, and 8MO35), which was occupied by people of the Glades culture, the ancestors of the Tequesta tribe. The Mud Lake Canal stretches 6.3 kilometers (3.9 miles) across Cape Sable, linking Bear Lake and the waters of Whitewater Bay with Florida Bay. The course of the canal bends and curves to avoid high and low areas, indicating the canal builders understood conditions of local topography and hydrology. The placement of the canal on the landscape provides clues about the significance of natural and artificial watercourses in the world-view of southern Florida Indians. The Mud Lake Canal, like most other

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aboriginal Florida canoe canals, is associated with a major mound site, in this case the Bear Lake Mound group.

The placement of the canal may have allowed inhabitants of the Bear Lake Mound group to control travel through the Cape Sable area.

ENVIRONMENTAL SETTING

The Mud Lake Canal is situated on Cape Sable at the extreme southern part of the continental United States mainland. Cape Sable marks the juncture of the freshwater Everglades and the saltwater of Florida Bay. The cape is a broad, flat landform that extends from the western border of southern Miami-Dade County to the west, enclosing the waters of Whitewater Bay, an expansive, shallow, brackish body of water. To the northwest the cape gives way to the myriad keys of the Ten Thousand Islands, which comprise the lower southwestern Florida coastline. White (1970:38-40) explains the geological origins of Cape Sable, noting that the area shares the oolitic limestone bedrock of the coastal ridge found in the Miami area. Apparently the cape accumulated as a series of beach ridges, and the adjacent islands and waters of Whitewater Bay may have been part of a drainage system similar to the modern-day Everglades. Pioneer naturalist Frank Craighead (1971:88-91) describes Cape Sable as part of his "Saline Mangrove Zone." The soils of the area consist of aragonite marls deposited by storms and mangrove peats accumulated in the mangrove forests. A coastal ridge, 1 to 2-feet above mean sea level, extends through the Cape Sable region (see Figures 2 and 3, Photographs 3 and 4). Prior to modern drainage, this natural levee or embankment divided the freshwater lakes, sloughs, and marshes from the brackish and marine environment of Florida Bay. Vegetation of the area is dominated by mangroves, with tropical hardwoods growing on higher areas like American Indian mounds and the coastal embankment (Craighead 1971:90). Small (1919:16) observed that the vegetation of Cape Sable was distinctive, since it combined aspects of the Florida Keys and the Everglades Keys; he suggests there may have once been a land connection between the Miami River region, Cape Sable, and the Florida Keys. Much of the Mud Lake Canal occurs in the marl or coastal prairie vegetation community described by Craighead (1971:101-105); this prairie

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is a marl flat that is part of the coastal ridge; vegetation includes grasses, saw palmetto, prickly pear cactus, agave, and seaside lavender with scattered buttonwoods (Small 1919). Craighead (1971:18, 101-102) notes that severe hurricanes in 1935 and 1960 have altered the vegetation and even the topography of the Cape Sable region, and that extensive clearing and burning of the area by humans in the nineteenth and twentieth centuries has likely removed hammock vegetation.

PERIODS OF SITE OCCUPATION

John Griffin's (2002:187-240) summary of excavations at the Bear Lake Mound group indicates occupation ranging from the Glades I late (1450-1200 B.P. [A.D. 500-750]) through Glades IIIa (750-550 B.P. [A.D. 1200-1400]) periods. This assignment is based on diagnostic ceramics as well as a series of 17 radiocarbon dates (Griffin 2002:212-213, 218, 220-221). Apparently the smaller mounds are associated with the earliest occupation of the site (Griffin 2002:206-209), while the later occupation was focused on the larger mound (see Figure 4). The Bear Lake Mound group (8MO33, 8MO34, and 8MO35) was listed as a National Register of Historic Places district in 1996, and a small segment of the Mud Lake Canal in the vicinity of the mounds was included within the district boundary (Schwadron 1996).

Wheeler (1998a:22) hypothesized that the Snake Bight Canal represented an earlier construction, possibly dating to the Glades I late or early Glades II periods, which may have been destroyed by a hurricane. In this scenario, the Mud Lake Canal represents a more recent construction, built during Glades II times to replace the Snake Bight Canal. Aerial photography and visits to the Snake Bight Canal indicate that portions of it are well preserved and appear similar to the Mud Lake Canal. It is, however, difficult to trace the entire route of the Snake Bight Canal.

Accelerator Mass Spectrometer (AMS) radiocarbon dates made on samples collected from cores in both the Mud Lake and Snake Bight Canals suggest that both features had begun to fill with detritus by the Glades IIIa Period (750-550 B.P. [A.D. 1200-1400]) (Ferek 2003:59-60) (Table 1). A research design to radiocarbon date

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prehistoric canoe canal features requires dating sediments within the filled canal bed, as well as undisturbed sediments from below and to the sides of the canal bed in order to bracket the dates of construction (see Carr et al. 2002:16, 21; Luer and Wheeler 2001:88-89). The radiocarbon assays obtained by Ferik (2003:60) only provide dates for a period after the canals had begun to accumulate sediment in their beds.

Considering the periods of occupation documented for the Bear Lake Mound group and the radiocarbon dates for the canal bed sediment, both the Mud Lake and Snake Bight Canals apparently were built and used during the Glades II Period (1200-750 B.P. [A.D. 750-1200]). This roughly corresponds to the late Woodland (1450-950 B.P. [A.D. 500-1000]) and early Mississippian (950-750 B.P. [A.D. 1000-1200]) periods in the broader southeastern United States as defined by Bense (1994:162-169, 199-208). The Mud Lake Canal appears to have been accumulating sediment by the Glades IIIa Period (750-550 B.P. [A.D. 1200-1400]), but it still could have been usable because those sediments are 50 to 70 centimeters below the surface of the present canal bed.

APPEARANCE OF THE SITE DURING THE PREHISTORIC OCCUPATION

Historian Lawrence Will's (1984:60-61) recollection of the Mud Lake Canal as it appeared in 1922 is helpful in understanding the magnitude of the construction and in creating a basis for describing its prehistoric appearance:

Mr. A.R. Livingston, civil engineer on our job [dredging the Homestead Canal], told us about this "aboriginal canal" which Dr. Goggin later discovered, saying that it extended from Mud Lake, just north of the mounds and near Coot Bay, in a southeasterly direction nearly to the bay at Snake Bight, and it to Whitewater Bay, it would have been possible for canoes to travel this shorter and protected route from the Gulf to the Bay of Florida.

Because of the straightness of this waterway it was believed to be the work of man.

Locating this ancient engineering feat in the towering mangrove forest was no trouble, for it was bordered by an impassible barrier of bushes and dense scrub. The stream itself was 20 or 30 feet wide and maybe a couple of feet deep, but was choked with a thick stand of small, scrubby mangroves. [Will 1984:60-61]

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Descriptions provided by botanist John Kunkel Small, who visited the Mud Lake Canal and Bear Lake Mounds at about the same time as Will, also are helpful in visualizing the canal and its relationship to the landscape and the mound group:

In addition to the twin mounds back of Flamingo [the Bear Lake Mounds], there is an aboriginal canal connecting Mud Lake with the Bay of Florida. This now abandoned channel once made the Cape Sable region an island. By means of it the aborigines could travel from the southern part of the Ten Thousand Islands to Mud Lake and through their canal to the Bay of Florida without going into the exposed and frequently rough waters of the Gulf of Mexico. [Small 1924:83]

It is true that the channel is mostly filled in, but in periods of the greatest drought the former ditch is always wet. Thus its vegetation differs from that in the region through which it runs. The natural growth is less dense and ferns do not grow there, as the soil is too continuously wet. The canal that is now filled in has small kitchen-middens on its banks. These consist mostly of the shells of the oyster, clam, and conch. [Small 1929:54-55]

All of these accounts suggest that the Mud Lake Canal was a significant landscape feature in prehistoric times. Small (1931:93) further notes that the American Indian settlement at the Bear Lake Mounds all but required the canal, since there is not a natural outlet from the mounds to Florida Bay. The mound group likely supported a cluster of pole and thatch structures, which would have been visible a considerable distance on the low, flat prairie of Cape Sable. Griffin (2002:240) suggests this was not a large village, but rather a small settlement of at least 50 people. Analysis of midden remains from the site indicates use of both freshwater and marine resources (Griffin 2002:225-239). Items typical of local and long-distance exchange systems include a few flakes of chert and a chipped stone tool, a piece of pumice, several sandstone artifacts, and one highly polished exotic stone plummet-form pendant (Griffin 1988:211). The canal was probably busy with canoe traffic, perhaps both local fisherfolk heading to the freshwater and saltwater environments linked by the canal, as well as travelers from neighboring areas using the passage that linked the Ten Thousand Islands to the west, the Florida Keys to the south, the Everglades to the north, and Biscayne Bay to the northeast. The small middens on the canal banks that Small mentions are fascinating, perhaps the remnants of camps of some of

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these passing travelers.¹ High ground suitable for camping is rare in the Cape Sable region and modern canoeists have to rely on raised platforms stationed along the route of the Wilderness Waterway. Interestingly, Griffin (1988:277-278) suggests that the Cape Sable area may have been a significant stop-over point in the broader patterns of Tequesta seasonality. He suggests that travelers moving between the upper Florida Keys and the Miami River area may have routinely used the Cape Sable area, moving from Biscayne Bay/Miami to Cape Sable via the Shark River Slough and then across Florida Bay to the Florida Keys in an essentially triangular pattern (Griffin 1988:278). Figure 5 shows the position of the Mud Lake Canal in relation to the archeological sites of southern Florida; note that the canal is located at a “pivot point” between sites of the Everglades, the Ten Thousand Islands, and the Florida Keys. If this scenario is accurate, the canoe canals at Cape Sable may have had a significant role in this seasonal movement.

It is not clear if the canal required routine maintenance—the removal of sediment, detritus and muck that accumulated in the bed. Construction of the canal, however, must have been a major undertaking involving planning and labor. Presumably the excavation could have been made with wooden and shell digging implements, though none have ever been found associated with any of the Florida canoe canals.

PAST AND CURRENT IMPACTS

The Mud Lake Canal maintains a high degree of integrity and is likely the best preserved example of an aboriginal canoe canal. Canals and other long, linear earthwork features have not fared well in the modern Southeastern U.S. In Florida, for example, damage from agriculture, sand mining, development, and modern drainage projects have severely impacted most of the other known aboriginal canoe canals (Luer 1998:30; Wheeler 1998b:178). For instance, plowing and sand mining have significantly altered, if not obliterated, large

¹ The small middens described by Small are certainly within the boundaries defined for the Mud Lake Canal NHL, but they have not been located by modern archeologists and they should not be considered as contributing properties at this time. Future studies to locate and archeologically test these camps may shed important light on the periods of use and function of the ancient canal.

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segments of the Ortona Canal complex. The inclusion of the Mud Lake Canal in Everglades National Park has been a major factor in the preservation of this feature.

There are a few places where the Mud Lake Canal has been affected by modern, twentieth century construction. The Homestead Canal, built in 1922, crosses the Mud Lake Canal at five places, accounting for small disruptions. The Old Ingraham Highway, the original road from Homestead to Flamingo, crosses the canal, as does the modern park road to Flamingo. Considering the length of the canal, these disturbances are relatively minor and have had little overall effect on the canal feature.

PREVIOUS INVESTIGATIONS

The Mud Lake Canal was first scientifically examined by Small (1924:82) during his botanical collecting trip across Florida in 1921. The canal also came to the attention of engineers and dredgemen working on the construction of the modern Homestead Canal in the year following Small's visit (Will 1959:29, 40-41). Apparently the canal had largely escaped attention until the construction of roads and drainage channels brought easier access to Cape Sable, though "old settlers" of the Ten Thousand Islands reported its existence to Hrdlička in 1918 (Hrdlička 1922:47). John Goggin (1950:231) mentions the Mud Lake Canal in his study of sites in Everglades National Park, and returned to examine both the Mud Lake and Snake Bight Canals more closely in 1950 (see Photograph 5, and compare with Photograph 6). Both canals were included in William Sears' (1966) Everglades National Park site location project, and Wm. Jerald Kennedy made several aerial photographs of the canals during that project. Griffin (1988:183) reports that the canals were visited during the 1982-1984 archeological surveys of Everglades National Park. Wheeler (1998) summarized existing information on the canal, studied aerial photographs to determine the canal configuration and length, and visited the canal to make profile drawings and observe the condition of the feature (see Photograph 7). Catherine Ferik (2003) has most recently studied the canals, both via remote sensing and application of Geographic Information Systems (GIS) analysis, as well as by coring the canal beds and recovering datable bulk soil samples. Ferik's

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(2003:44-46) remote sensing study may be valuable in identifying other aboriginal canal features and enhancing existing aerial photography in order to follow the canal routes. The remote sensing aspect of Ferik's work confirmed earlier identifications of the canal signature on aerial photographs, the canal route, and length.

ARCHEOLOGICAL DEPOSITS AND FEATURES*The Mud Lake Canal*

Regarding the physical attributes and course of the Mud Lake Canal, Goggin provides some information:

The canal apparently originates at Mud Lake, but first clearly appears east of Bear Lake 3, and from there runs southeast cutting across Ingraham Highway and still further along crosses the Flamingo road .95 miles south of the Ingraham Highway. The area traversed by the canal is largely mangrove swamps and marl prairies. It is 20 to 30 feet wide and 1 to 2 feet deep.
[Goggin n.d.:185-186]

The Mud Lake Canal was included in the original archeological base-mapping project of the Everglades National Park, and oblique aerial photographs were produced during that research (Sears 1966) (Photographs 1 and 2). Griffin (1988:182-183) notes that the easternmost portion of the canal was visited by National Park Service personnel during the archeological survey of Everglades National Park, and presents a map showing the course of the canal, probably made from aerial photographs (Figure 3). The canal position delineated by Griffin (1988:182) is similar to an obvious aboriginal canal signature evident on a 1984 aerial infrared photograph (National High Altitude Photography [NHAP] 1984) (Photograph 4). Older aerial photographs (United States Department of Agriculture [USDA] 1953) were examined, and these also show the course of the canal, which was holding water in most places in the 1950s (Photograph 3). Measurements from these photographs show that the Mud Lake Canal crosses an area 4.3 kilometers (2.7 miles) in length. However, the total length of the canal feature is 6.3 kilometers (3.9 miles) in length, if each of the six distinct segments is measured separately.

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Like other aboriginal canals in Florida (Wheeler 1995:273-274), the Mud Lake Canal links natural bodies of water and uses existing drainages or waterways as a source of energy. It also is likely that groundwater provided some water for the canal. Craighead (1971:6) notes that Coot Bay and other lakes behind Cape Sable were freshwater ponds prior to the construction of modern drainage canals in the 1920s and 1950s. These freshwater ponds were used to charge the Mud Lake Canal. The embayment, labeled on Figure 2, and clearly visible on the aerial photograph in Photographs 3 and 4, divided the freshwater lakes and sloughs from the brackish and salt waters of the mangrove forest and Florida Bay (Craighead 1971:49, 51-52). Will (1984:76, 78) describes dramatic changes in this freshwater system that occurred as the drainage canal progressed further along the cape, allowing the once freshwater to become brackish.

The Mud Lake Canal has several distinctive curved segments, as well as a long straight segment. The sharply curved segments are most obvious in the vicinity of the Bear Lake Mounds. Research on the Pine Island Canal indicates the aboriginal builders curved parts of its channel to avoid low areas or steep areas that could interfere with retaining water in the channel (Luer and Wheeler 1997:122). At one point the Mud Lake Canal crosses a gap in a natural levee or embayment. Two distinct drainage basins occur on either side of this natural levee—one flows south toward Flamingo, the other flows east toward Snake Bight. The exact place where the canal enters Florida Bay has not been determined, and it is possible that it terminates in the innumerable small creeks and passages that characterize the mangrove coast of the area. The serpentine course of the canal and its apparent premature end in the mangrove channels may have been intended to protect the freshwater sources of Mud Lake and Coot Bay from the extreme tides of the region and possible contamination by salt water. Modern construction of drainage ditches, like the Homestead Canal, failed to consider such consequences and have radically altered the fresh and salt water balances of the area. The freshwater of the Everglades and the lakes of Cape Sable have long since been invaded by salt water and colonized by mangroves and other salt loving plants.

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Wheeler (1998a:20) visited Cape Sable in 1997 and observed that the canal is well preserved at several points where it is bisected by the Homestead Canal. The embankments are covered with red and black mangrove, cacti, saw palmetto, cabbage palm, stopper, gumbo limbo, mahogany, and strangler fig (Photograph 7). Profiles made during Wheeler's visit in 1997 confirm the earlier descriptions of the canal dimensions; one profile showed the width of the channel bottom to be 8.8 meters (28.9 feet), with low banks on either side, each approximately 25 centimeters in height (Figure 6). The gentle slope of the sides of the channel appears to be approximately 1:26, similar to other aboriginal canoe canals in Florida (Wheeler 1995:273). The bed of the channel is carpeted with the pneumatophores of the black mangrove, and holds water in some places. As Small (1931:94) notes, the graded road bed built by the dredge has sunken in where it crosses over the place where the canal once ran. Will (1984:60-61, 66) illustrates the Mud Lake Canal as it appeared in 1922 and 1966, noting that the Labor Day hurricane of 1935 destroyed the giant red mangroves leaving only whitened trunks (Photograph 6). This damage is clearly evident on the photographs taken by Goggin in 1950 (Photograph 5).

Due to the re-growth of vegetation, the current appearance of the canal is most like that figured and described by Will (1984:60) for 1922. Wheeler (1998a:20) noted several small hammocks along the canal banks to the southeast of the Bear Lake Mounds, and these may contain the middens that Small (1929:54-55) mentions, although no shovel tests were made to confirm this. These hammocks are most apparent where the canal passes near the high ground of the natural levee.

Stratification and Deposits

Catherine Ferik (2003:49-59), as part of her Master's thesis project, extracted eight cores from the Mud Lake and Snake Bight canals using 2-inch diameter PVC tubes (see Figure 7 for three core locations). The three Mud Lake Canal core profiles are shown in Figure 8; they indicate two main strata: 1) an upper deposit of humic soil, decayed leaves, and loam ranging in thickness from 6 to 27 centimeters, and 2) a lower stratum of gray marl. Both deposits likely represent fill deposited in or over the canal during storm events or during

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periods when organic detritus accumulated. Core #4, which came from the edge or bank of the canal, exhibited at least two buried soil horizons within the marl zone, the first around 27 centimeters below the surface and the second around 56 centimeters below the surface. These buried soil horizons may represent intervals between storm events when organic material slowly accumulated. Ferik (2003:54) also notes that some organic material was preserved in the marl layers as well, including a piece of tree bark in Core #4 at 22 centimeters below surface. The core profiles indicate, however, that a maximum depth of 1.07 meters was reached in Core #3, which suggests that the base of the original canal bed may not have been encountered in many of the samples. The cores from the Snake Bight Canal were similar, and one of the samples included a bivalve shell (Ferik 2003:56-58). Ferik's (2003) work is important, since it confirms previous ideas about marl deposits in the Cape Sable canals, which may have rendered them unusable, and her study indicates that the canals can yield material suitable for stratigraphic study and radiocarbon dating.

Comparison to Other Florida Canoe Canals

The Mud Lake Canal is much like the other American Indian-dug watercourses of southern Florida as well as Walker's Canal, located in the Florida panhandle (see Figure 9 and Table 2). The canal engineers of northwestern and southern Florida used the same strategy of linking natural aquatic features, bowing the channel to avoid areas with rapidly changing relief, and digging a channel with a roughly trapezoidal shape. In all Florida canoe canals studied, the canal features traversed areas of differing elevation, indicating that these were not simple ditches connecting sea level features, but rather complex engineering accomplishments, requiring planning and detailed knowledge of local conditions.

Chronological Position. Only in recent years have archeologists devised ways of radiocarbon dating the aboriginal canoe canals. Carr et al. (2002) dug trenches across the eastern Ortona Canal (8GL4A) and documented the progressive in-filling of the canal channel. They removed bulk soil samples from within the filled-in channel, which were radiocarbon dated. The results indicate that the canal was probably dug during

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the Glades I Period (ca. 1949-1200 B.P. [ca. A.D. 1-750]), which is consistent with artifacts and dates from the associated Ortona mound complex (Carr et al. 2002:21). Luer and Wheeler (2001) tried a similar method at the Pine Island Canal (8LL34), but found that a highly organic “hard pan” layer had reformed within the canal bed. Extensive movement of organic material within the soil resulted in radiocarbon dates from within and to the side of (outside) the channel that were statistically similar. Ferik’s (2003) radiocarbon dates for the Mud Lake and Snake Bight canals suggest both features had begun to accumulate sediment by the Glades IIIa Period (ca. 750-550 B.P. [ca. A.D. 1200-1400]), and were likely built during the Glades II Period when the Bear Lake Mound group was most heavily occupied.

Prior to attempts to radiocarbon date the aboriginal canoe canals, archeologists relied on associated sites to help in dating the canals. For example, the Pine Island Canal is associated with both the Pineland site complex and the Pine Island 8 Burial Mound, suggesting that the canal was built and used during the late Glades II through Glades IIIc periods (ca. 950-187 B.P. [ca. A.D. 1000-1763]). Similarly, Walker’s Canal (8WL344) is associated with a large group of sites on the Fourmile Point peninsula, many of which date to the Weeden Island and Fort Walton periods. Site 8WL334, a small artifact scatter adjacent to the canal, produced sherds dating to these periods, helping to confirm that the canal was probably built and used between 1450 and 450 B.P. [A.D. 500 and 1500] (Wheeler 1998b). This would coincide with the hypothesized dates of canal building in southern Florida (Luer 1989:89, 126; Wheeler 1995:265). Determining chronological position and cultural affiliation remains one of the greatest challenges in further research on aboriginal canals.

Length. The aboriginal canals of Florida tend to traverse relatively long distances. The Mud Lake Canal, at the very southern tip of the Florida peninsula, is the longest canal, with a total channel length of 6.3 kilometers. The serpentine course of this canal accounts for its length—the linear distance covered by the canal is only 4.3 kilometers. This is rivaled by the 6.9 kilometers Ortona Canals, where two separate canals funneled travelers through the Ortona mound complex. At 1.19 kilometers, Walker’s Canal is most similar in length to the Naples Canal, which was 1.26 kilometers. Despite comparable lengths, these canals cross very different

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terrains and functioned in equally different fashions. Canal length appears to have been governed by a number of factors, including distance between features to be connected, details of local terrain (such as low areas or steep areas), and association with archeological sites.

Sources of Water. All of the Florida canals served to link natural bodies of water in order to provide transportation corridors. Interestingly, none of the Florida canals were simple sea level channels, and all involve complex engineering solutions to problems posed by variations in elevation and geomorphology along the course of the canals. The Mud Lake and Snake Bight canals of Cape Sable are similar to Walker's Canal, as well as the Ortona Canals—all of which were supplied with water by natural freshwater sources. The Mud Lake and Snake Bight canals were fed by water from the Everglades, impounded in freshwater lakes behind the coastal embayment. The Ortona Canals were fed by natural streams that were essentially being extended via the artificial canals. Calculation of flow and discharge rates in the Ortona canals indicates that the channels were designed to replicate the rates for natural streams and waterways of the region (Wheeler 1995:276).

Other southern Florida canals relied on generating a balance between groundwater and surface runoff input against discharge output (Luer and Wheeler 1997:119; Luer 1998). Research indicates that canals were constructed in soils with relatively high water tables, as is the case with Walker's Canal and the Pine Island Canal. The use of groundwater as a source of water would have made the construction of open channels difficult, and probably involved more complicated engineering solutions, like the use of dams or spillways. Luer and Wheeler (1997) hypothesized a series of stepped impoundments for the Pine Island Canal, and Luer (1998) and Wheeler (1998b) developed similar models for the Naples Canal and Walker's Canal. These models suggest that the canal builders fashioned a number of inter-related impoundments that functioned independently, in order to maintain water levels in different parts of the canal, especially in areas with steeper slopes. The discovery of Frank Hamilton Cushing's "lost manuscript," providing details of his 1895-1896 visit to southwestern Florida, helps confirm that such wooden control structures and impoundments may have existed at the Pine Island Canal and Naples Canal (Kolianos 2001:175; Kolianos and Weisman 2005:65-66,

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102; Luer 1998:35[note 8]). At this time there is no indication that the Mud Lake Canal had such control structures or impoundments, but future studies should consider this possibility by examining details of topography and ground water.

Association with Archeological Sites. Many of the southern Florida canals are associated with midden sites or larger site complexes (Table 2). Walker's Canal may have had a small artifact scatter site on its embankment. The Florida Master Site File places 8WL334, a scatter of pottery and shell, along the course of the canal. This is consistent with descriptions of the Mud Lake Canal, where small shell middens were noted along the embankments by naturalist John K. Small (1929:54-55). Apparently these sites formed as American Indians camped along, or disposed of refuse on, the canal banks during their canoe journeys.

Some canals are integral features of larger site complexes. A pair of canals links the Ortona mounds and earthworks with the Caloosahatchee River. A river ford and trail between the intersection of the canals and the river allowed the inhabitants of Ortona to control east-west river traffic, as well as north-south foot traffic through their territory. The Mud Lake Canal is associated with the Bear Lake Mounds, which provided a strategic location for controlling traffic between southeastern Florida, the Florida Keys, and the Ten Thousand Islands.² The Pine Island Canal also is associated with several major archeological sites, and lies along an east-west axis of alignment that links a number of other sites (Luer 1989:121-123). Walker's Canal, however, does not seem to be involved directly with any large site complexes, indicating that it is more like the Naples Canal, which also lacks any direct association with large sites (Luer 1998; Wheeler 1998b).

ASPECTS OF INTEGRITY

Integrity of the Mud Lake Canal and other Florida Canoe Canals

² The Bear Lake Mound Group is not considered part of the proposed landmark, but is discussed here since it provides a context for the Mud Lake Canal and association with the Glades culture and the ancestors of the Tequesta Indians. The mound group and a small portion of the canal were included in a NRHP nomination of the Bear Lake Archeological District (listed November 11, 1996).

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The Mud Lake Canal is the best preserved example of a Florida aboriginal canoe canal. Like many aboriginal earthworks in Florida, the other canal sites have suffered from agriculture, sand mining, and development. For example, the Ortona Canal (8GL4) complex has suffered from plowing, which has reduced the visibility of the canal banks, and from sand mining, which has obliterated a considerable portion of the eastern Ortona Canal (Carr et al. 2002; Wheeler 1995). Likewise, the Pine Island Canal (8LL34) has suffered from clearing associated with agriculture and the remaining portions are now threatened by residential development (House 2000; Luer and House 2001). The Naples Canal (8CR59) has vanished in the face of modern commercial and residential development (Luer 1998). Walker's Canal (8WL344) also has suffered from development, though about half of the site is preserved within a private conservation area. The inclusion of the Mud Lake Canal within Everglades National Park is responsible for the high level of integrity exhibited by this site. Apparently this is not only true of sites in Florida, since the 1963 National Historic Landmark documentation for the Hohokam-Pima Irrigation Sites in Arizona indicate that "most of the striking remains [of the canals] have been obliterated." Despite the poor to fair condition noted for these sites, they were designated National Historic Landmarks.

In the case of the Mud Lake Canal the immediate vicinity of the feature has never been plowed or used for agriculture. In fact, few people lived in the area in the nineteenth and early twentieth centuries prior to the establishment of Everglades National Park in 1947. The Mud Lake Canal has been disturbed in two ways—natural forces such as erosion have affected the banks of the canal, and the construction of roads and drainage structures in the twentieth century have affected the canal in a few places. The construction of the Ingraham Highway crossed the Mud Lake Canal in one place, and the Homestead Canal crosses the prehistoric canal four times. These disturbances surely obliterated the canal's banks and bed, but the disruption accounts for less than one percent of the entire canal's length. Erosion of the banks has certainly occurred, but hurricanes have deposited marl from Florida Bay over parts of the canal, which probably has aided in preserving deposits that can be radiocarbon dated. The considerable degradation of the other known aboriginal canoe canals coupled

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with the high degree of integrity makes the Mud Lake Canal the best example of this rare archeological site type.

Integrity

Major applicable aspects of the Mud Lake Canal's integrity are summarized below:

Location. The location of the Mud Lake Canal at the southern tip of the mainland continental United States is perhaps one of the most dramatic aspects of the site. Modern visitors to this part of Everglades National Park come away with the feeling that they have visited one of those unique places that inspires a sense of being at the edge of the world. Traffic is limited and there are no shops, high-rise buildings, or other significant evidence of the modern commercial, industrial or residential world. In some ways this stands in counterpoint to the site as it existed in prehistoric times. The Bear Lake Mounds and the Mud Lake Canal was likely a major hub of canoe travel between the Everglades, Ten Thousand Islands and Florida Keys. Griffin (1988:183), in his *The Archeology of Everglades National Park: A Synthesis*, comments on the obvious relationship of the Mud Lake Canal and the Bear Lake Mounds and points to John Kunkel Small's (1924:83) amazing description of the site, which, as he notes, "once made the Cape Sable region an island." The location within Everglades National Park accounts for the high level of integrity exhibited in the Mud Lake Canal, as well as providing subtropical surroundings that accurately reflect the environment of the Tequesta Indians and their ancestors.

Design. Design may be the most important element of the Mud Lake Canal's integrity and overall significance. The recognition that the Mud Lake Canal and the other Florida aboriginal canals represent significant engineering feats is made all the more noteworthy by the Mud Lake Canal's well-preserved course and archeological deposits. Significant is the fact that the Mud Lake Canal is not a simple ditch connecting bodies of water that are at the same elevation; elevations at the head of the canal, in the vicinity of Mud Lake, are around 2 and 3 feet above sea level, while those in the vicinity of the modern park road are 1 foot above sea level, with the canal eventually reaching sea level in the tidal swamp bordering Florida Bay (United States

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Geological Survey 1973). Future studies of aboriginal canoe canals will likely focus on the Mud Lake Canal, since its intact topographical setting can be studied through innovative mapping techniques like LIDAR, laser 3-D scanning and GIS. Details of the topography traversed by the canal, understood by the canal's builders, could be studied with sophisticated modern mapping. This could shed light on the serpentine nature of the canal's upper course, how the ancient builders dealt with crossing the coastal embayment, and how they maintained the canal. Most important is the fact that the Mud Lake Canal, like the other canoe canals, was not a simple ditch, but a complex engineering accomplishment; construction of such a feature required detailed knowledge of local topography and hydrologic conditions, which are still preserved today in the canal's banks, bed and course.

The size of the canal and the shape of the banks and bed also are important elements of the design and are very similar to other prehistoric canals in Florida, as well as prehistoric irrigation canals in the southwestern United States. In many ways the design on the Mud Lake Canal is iconic of the aquatic adaptation that it was built to serve. Unlike modern drainage ditches, which are designed to remove water, the prehistoric canal was designed to channel water for use in travel and transportation. This fundamental difference is reflected in the shape and layout of the canal and is very different from ditches built in Western and American cultures (Wheeler 1995:272-273). Even early American canals and drainage ditches, like those associated with the 1770 New Smyrna Colony in eastern Florida, were different from the prehistoric canals, typically built with a more rectangular cross-section and ignoring natural features and changes in the landscape. The differences in design reflect the different approaches to water and aquatic resources.

Setting. The setting within the natural areas preserved by Everglades National Park contributes to the high level of integrity seen in the Mud Lake Canal. Plants along the course of the canal include grasses, saw palmetto, prickly pear cactus, agave, and seaside lavender with scattered buttonwoods, typical of the marl or coastal prairie vegetation community as described by Small (1919) and Craighead (1971:18, 101-102). Both Griffin (1988:184) and Craighead (1971:18, 101-102) note that severe hurricanes have altered the vegetation

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and even the topography of the Cape Sable region, though this seems to be a natural process that likely occurred in prehistory as well.

Feeling. Visitors to the Mud Lake Canal can easily find its sandy banks and muddy bed at places where the Homestead Canal cut across it. During most of the year the canal is full of water and it does not take much to imagine the ancient Floridians paddling dugout canoes in the watercourse or resting on the canal's banks. The subtropical vegetation and desolation of Cape Sable contribute to the feeling one gets at the Mud Lake Canal, which makes a strong impression on even seasoned archeologists once they realize the length of the canal and the skill that went into its construction.

Non-contributing Resources

Small portions of the Homestead Canal, the Old Ingraham Highway, and the modern Everglades Park Road exist within the boundaries defined for the Mud Lake Canal.

Historian Lawrence Will (1984) provides a fascinating, firsthand account of the construction of the Homestead Canal in 1922, when he worked on the dredge crew that cut a channel across Cape Sable as part of a massive effort to drain and develop the Everglades. The Homestead Canal runs about 10 or 11 miles east-west across Cape Sable before it turns and follows the road that the Model Land Company began in 1916. The canal itself is only 25 to 30 feet wide and about 6 feet deep—much less impressive in many ways than its prehistoric counterpart and a harrowing nine month task to build with a steam dredge. The Homestead Canal cuts through the prehistoric canal in four places in the vicinity of the Bear Lake Mounds, probably accounting for the disturbance of about 40 to 60 meters of the canal's 6.3 kilometer length (see Figure 2 and Photograph 1).

The Old Ingraham Highway was extended by the Model Land Company to the community of Flamingo in 1922, the same year the Homestead Canal was built. The road is merely a rutted track with limestone gravel. Tebeau (1963:106) talks about the earlier settlers in Flamingo, which was first occupied in the late nineteenth century when access was strictly by boat. The appearance of the road was documented by botanist John Kunkel

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Small at a place where it crosses the Mud Lake Canal (Negative No. Sm1665 in the Florida State Archives). At the time of its construction, the Old Ingraham Highway or Flamingo Road likely had little impact on the prehistoric canal.

The most recent modern feature to cross the Mud Lake Canal is the current paved park road, which largely follows the Old Ingraham Highway. Built in the 1950s or 1960s, the modern park road was diverted from the angular course of the old gravel trail as it nears Flamingo. Like the Homestead Canal and the Old Ingraham Highway, the modern park road only disturbs a small portion of the ancient canal. Collectively these three features of the modern or recent past constitute non-contributing resources within the boundaries of the Mud Lake Canal.

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8. STATEMENT OF SIGNIFICANCE

Certifying official has considered the significance of this property in relation to other properties:

Nationally: X Statewide: Locally:

Applicable National

Register Criteria:

A B C X D X

Criteria Considerations

(Exceptions):

A B C D E F G

NHL Criteria:

Criteria 4 and 6

NHL Theme(s):

I. Peopling Places (ethnic homelands);
III. Expressing Cultural Values (architecture, landscape architecture, and urban design)
V. Developing the American Economy (transportation and communication)
VI. Expanding Science and Technology (technological applications)

Areas of Significance:

Archeology – Prehistoric; Engineering

Period(s) of Significance:

1200-55- B.P. [A.D. 750-1400]

Significant Dates:

N/A

Significant Person(s):

N/A

Cultural Affiliation:

Glades II (1200-750 B.P. [A.D. 750 – 1200])
Glades IIIa (750-550 B.P. [A.D. 1200 – 1400])

Architect/Builder:

N/A

Applicable Theme Study:

Southern Florida Sites Associated with the Tequesta and their Ancestors
(aboriginal watercourse or canal)

State Significance of Property, and Justify Criteria, Criteria Considerations, and Areas and Periods of Significance Noted Above

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SUMMARY

A National Historic Landmark theme study, *Southern Florida Sites Associated with the Tequesta and their Ancestors*, has been prepared by the Florida Division of Historical Resources (2004) in order to document and demonstrate the national significance of sites occupied by the Tequesta peoples in the Everglades of southern Florida and adjacent areas.

The Mud Lake Canal is considered nationally significant under National Historic Landmark Criteria 4 and 6. Under NHL Criterion 4, which deals with the distinctive physical characteristics of design, construction, or form, and distinguishing characteristics of an architectural type specimen exceptionally valuable for a study of a period, style or method of construction, the Mud Lake Canal is significant because it is the best preserved example of a rare prehistoric engineering feat—a long-distance canoe canal. Review of the literature suggests that Florida is the only place that long-distance canoe canals were constructed in North America during pre-Columbian times. Luer (1989:124-125) has indicated that a significant amount of labor is involved in planning and constructing functioning canoe canals, as well as a detailed and complex understanding of local topographic and hydrologic conditions. He also suggests that canals were important in exchange networks that relied on movement of goods primarily along aquatic routes, and that the construction of the canals may have relied on labor provided as tribute to political leaders (Luer 1989:116-121).

Under NHL Criterion 6, which deals with properties that have yielded or may be likely to yield information of major scientific importance, the Mud Lake Canal (8MO32) is a nationally significant example of an aboriginal artificial watercourse or canal as defined in the NHL theme study *Southern Florida Sites Associated with the Tequesta and their Ancestors* (Wheeler 2004:44). The site is a rare and well-preserved example of an aboriginal canoe canal, a type of site that is unique to Florida and the Southeast in terms of North American prehistory and archeology. Recent research has documented that the canal channel contains stratified deposits that can be radiocarbon dated. This is extremely significant in terms of future research on the cultural affiliation, function, use and age of aboriginal canoe canals in the southeastern United States. Artifacts from the

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Bear Lake Mound group, located near the canal, are of the Glades culture, the ancestors of the Tequesta people, who are significant because of their cultural persistence following European contact and their association with the unique environment of the Everglades. Aboriginal canoe canals, like the Mud Lake Canal, are significant since they may be indicators of cultural complexity and since they represent the ultimate expression of the aquatic-oriented lifestyle of the native Florida peoples.

The Mud Lake Canal meets NHL Criterion 6 for its archeological potential to provide nationally significant information of major scientific importance about seasonal movements of people, the development of social complexity, aboriginal engineering ability and accomplishments, and the paramount importance of waterways in the pre-European contact period in Florida and the southeastern United States. The Mud Lake Canal meets NHL Criterion 4 as it represents a major American Indian engineering work that is part of a tradition involving a sophisticated and complex understanding of local topographic and hydrologic conditions.

In terms of the potential for contributing new information, Ferik's (2003) work at the Mud Lake Canal demonstrates that the bed contains deposits that can be radiocarbon dated. This is important, since not all of the prehistoric canoe canals in Florida have such deposits. Attempts to radiocarbon date sediments in the bed of the Pine Island Canal, for example, were unsuccessful (Luer and Wheeler 2001). At this time only one AMS radiocarbon date has been obtained on materials from the Mud Lake Canal, but future research at the site should include obtaining a number of dates from inside and outside the canal bed from a number of places along the route of the canal. The Mud Lake Canal will figure prominently in future research on the chronological position of the canoe canals. The largely undisturbed character of the canal and the surrounding topography also are avenues for future research regarding the way in which the canal was sited and constructed in order to function properly.

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The Mud Lake Canal is considered significant in terms of the NHL themes Peopling Places, Expressing Cultural Values, Developing the American Economy, and Expanding Science and Technology (National Park Service 1993).

I. PEOPLING PLACES*Ethnic Homelands*

The theme “Peopling Places” examines human population movement and change through prehistoric and historic times. The topic “ethnic homelands” is relevant to the Mud Lake Canal as it relates to the identity of the Tequesta Indians and their ancestors (National Park Service 1993).

The Mud Lake Canal is significant in terms of its identity and context as an American Indian archeological site associated with the Tequesta and their ancestors. The NHL theme study *Southern Florida Sites Associated with the Tequesta and their Ancestors* recognizes aboriginal watercourses and canals as one distinctive property type associated with the Tequesta people. Archeological sites associated with the Tequesta and their ancestors provide the primary source of information on this group and are recognized as significant at the national level for several reasons, including their adaptation to and relationship with the Everglades, which is acknowledged as a unique hydrological and environmental system. Tequesta culture, including a reliance on aquatic resources and water transport, evolved as the Everglades developed during rising water levels some 5,000 years ago. Sites of the Tequesta are recognized as significant because they are part of a broader tradition of long-distance canoe canal building. Such canals are unique to Florida and reflect the aquatic and subtropical adaptation of the people that built them. The Tequesta also are significant because they are one of the first recorded Native peoples encountered by Ponce de Leon when he explored the Florida coast in 1513. Some Tequesta sites contain materials associated with this period of early European contact and exploration, as well as later evidence of settlement, missionization, and exchange. These sites are significant, since they may harbor the relatively rare patterns related to culture contact and change. Unlike many other Southeast Indian groups, the

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Tequesta and their neighbors preserved traditional cultural patterns well into the early eighteenth century. This makes them an important case study in comparison to native southeastern peoples that were subjected to more intensive missionization, disease, and slavery.

III. EXPRESSING CULTURAL VALUES

Architecture, Landscape Architecture, and Urban Design

The theme “Expressing Cultural Values” covers expressions of culture-people’s beliefs about themselves and the world they inhabit. The topic of “architecture, landscape architecture, and urban design” is relevant in understanding the significance of the Mud Lake Canal, especially when the canal is considered as an architectural feature—the melding of art and construction (National Park Service 1993).

Research indicates that long-distance canoe canals have not been documented in other parts of the Southeast or in North America. Other kinds of Indian-dug earthworks, especially ditches for irrigation or defense, are associated with mound sites in other parts of the Southeast. For example, Kidder (1992:109-111) reports a system of ditches and embankments that was designed to control and store water at the protohistoric Jordan site in Louisiana (ca. 408-268 B.P. [ca. A.D. 1542-1682]). The Mud Lake Canal and the other Florida canoe canals are different because they were designed for purposes of travel. The Jordan site ditches, however, follow the same pattern of design found in some of the Florida canals, namely in their use of natural water bodies as a source of water. The technique of using natural drainages to feed artificial channels also is evident at the Toltec site in the Arkansas River valley, where a relict stream channel was used in conjunction with an artificial ditch to surround the entire site (Rolingson 1990).³ In fact, ditches, moats, and canals are intrasite features at many Mississippian-related mound complexes throughout the Southeast, including Etowah in Georgia (Larson 1972:386-387), Parkin in Arkansas (Morse 1981:17-19), and Lake George in Mississippi

³ The Toltec site was designated a National Historic Landmark June 2, 1978.

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(Williams and Brain 1983:64-68).⁴ Kidder and Saucier (1991:328-330), in reviewing information on ditches and moats at Southeastern sites, note that while these features may have held water, they were primarily defensive. Many sites in Florida (e.g., Fort Center, Mound Key,⁵ and Pineland⁶) also have internal site components relating to water control, including canals, ditches, and borrow pits or artificial ponds (Cushing 1897:421; Johnson 1996:249-251; Luer 1991). Unlike the defensive moats or ditches of other sites of the Southeast, the Mud Lake Canal, along with the other long-distance canals of southern Florida, was designed for transportation and provided an effective means for controlling travel through a given region. Collectively, however, these sites in Florida and the Southeast demonstrate a widespread technology related to controlling surface water.

V. DEVELOPING THE AMERICAN ECONOMY

Transportation and Communication

The theme “Developing the American Economy” reflects the ways Americans have worked, including slavery, servitude, and non-wage as well as paid labor. It also reflects the ways they have materially sustained themselves by the processes of extraction, agriculture, production, distribution, and consumption of goods and services (National Park Service 1993). The topic “transportation and communication” is helpful in considering the significance of the Mud Lake Canal

The Mud Lake Canal also is significant since it may have figured prominently in seasonal movements of people between the Miami River/Biscayne Bay area and the upper Florida Keys, as John Griffin has suggested (1988:278). Alternatively, the strategic location of the canal at a major crossroads may have allowed the residents of the Bear Lake mound group to control traffic moving between the Ten Thousand Islands, upper Florida Keys, and Everglades (Wheeler 1998a). Griffin’s (1988) summary of artifacts and animal remains from

⁴ Etowah, Parkin and Lake George (Holly Bluff) were designated National Historic Landmarks June 19, 1964 under Theme Study II & III, Early Indian Farmers & Villages and Communities prepared by William G. Haag.

⁵ Mound Key was listed in the NRHP August 12, 1970.

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the Bear Lake Mounds suggest that the canal may have been involved in the local transport of marine resources to the site, as well as broader patterns of local and regional exchange that involved items such as sandstone, pumice, and exotic ground stone objects. Ferik's (2003) recent work at the Mud Lake and Snake Bight canals suggests that both features contain stratified deposits and material that can be successfully subjected to radiocarbon dating. This suggests that the alternative hypotheses regarding the construction and function of the Mud Lake and Snake Bight canals can be tested through further work. Future studies should attempt to locate midden deposits along the canal banks and involve excavations across the canals to expose profiles and collect more samples for radiocarbon dating.

Further significance of the Mud Lake Canal is found in its direct and indirect relationship with aboriginal watercraft. Canoeist and educator Charles Blanchard (1999:40) explores American Indian use of canoes in Florida waters, recognizing that the Indian canoe was a tool that served as "pack animal and work bench." Blanchard's (1999:40-41) metaphor illuminates the complex relationship that existed between Indian canoeist and canoe. The construction of canoes, canoe use, routes utilized, the timing of trips, cargos carried, items collected, and the siting of camps, landings, and settlements all are elements of an evolved and efficient adaptation. Dobyns (1983:239-240) also recognizes the significance and efficiency of the canoe among native Florida cultures, citing one sixteenth century Spanish account that recommends the systematic destruction of Indian canoes as the best means to disrupt native society (see Bartolomé de Argüelles account in Quinn 1979:88-92). Dobyns (1983:242-244) further notes that anthropologists tend to overlook the role of the canoe in the emergence of cultural complexity, and he suggests, rather, that canoe efficiency in moving subsistence, exchange, and tribute items aided in the development of large villages and the need for communal storage among contact period groups such as the Timucua. The views of Blanchard (1999) and Dobyns (1983) help in understanding why so many canoes have been found in Florida waterways (see, for example Wheeler et al. 2003); like the ubiquitous stone tools and ceramics that are readily identified with native Florida cultures, the

⁶ Pineland was listed in the NRHP November 27, 1973.

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canoe was a tool of central importance in an aquatic-oriented culture. Luer (1989:124) furthers this argument, suggesting that the canoe was not only significant for transport and subsistence activities, but may have held an archetypal role in native Florida society and cosmology.

The extensive systems of natural waterways in Florida support Dobyns (1983:242-244) recognition of the significance of water transport in native Florida. Brenner et al. (1990:364-365), for example, report that there are over 7,800 lakes in Florida covering about 6 percent of the total landmass. Most of these are small lakes, though five have surface areas greater than 100 kilometers², including Lake Okeechobee, Lake George, Lake Kissimmee, Lake Apopka, and Lake Istokpoga. Likewise, Nordlie (1990:392-392) indicates that there are over 1,700 rivers in Florida, with most of the major ones linking interior areas to the Gulf of Mexico or Atlantic Ocean. Added to these in southern Florida are the Everglades and the many streams, that now have canals, that drained this freshwater marsh to coastal lagoons and bays. Wheeler (1995:278, Figure 1) argued that these natural waterways, along with canoe trails identified on satellite photographs and early maps, were part of an extensive, aquatically-based travel and communication system. The central position of canoes and water travel in the native cultures of Florida ultimately contributed to the construction of long-distance canoe canals that linked settlements, overland paths, canoe trails, and natural waterways (Luer 1989; Luer and Wheeler 1997; Wheeler 1995). The evidence for early canoe-making at sites like the Lake Pithlachocco Canoe Site (Newnans Lake)⁷ in north-central Florida suggests that such traditions ultimately led to such engineering feats as the Mud Lake and Snake Bight canals.

VI. EXPANDING SCIENCE AND TECHNOLOGY

Technological Applications

The theme “Expanding Science and Technology” focuses on science, which is modern civilization’s way of organizing and conceptualizing knowledge about the world and the universe beyond (National Park Service

⁷ Lake Pithlachocco Canoe Site was listed on the NRHP March 27, 2001.

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1993). This is done through the physical sciences, the social sciences, and medicine. Technology is the application of human ingenuity to modification of the environment in both modern and traditional cultures. Analogous to the Mud Lake Canal is the Alibates Flint Quarries National Monument in Texas, which reflects pre-Columbian innovations in procurement and working of stone tools. The topic “technological applications” is most relevant in the case of the Mud Lake Canal.

Research into the placement and size of the Mud Lake Canal reveals that, like other long-distance canoe canals, this feature was a major undertaking in terms of planning and construction (and possibly maintenance). The Mud Lake Canal was not a simple ditch connecting two sea level bodies of water; elevations at the head of the canal in the vicinity of Mud Lake, are around 2 and 3 feet above sea level, while those in the vicinity of the modern park road are 1 foot above sea level, eventually reaching sea level in the tidal swamp bordering Florida Bay (United States Geological Survey 1973). Like the other Florida canoe canals, the Mud Lake Canal traversed several different environments and crossed areas of differing elevation. The Mud Lake Canal also is the longest of the Florida canoe canals at 6.3 kilometers (3.9 miles). This suggests that the canoe canal builders possessed a detailed knowledge of the local hydrological and topographical conditions and were able to create an engineering feature that dealt effectively with changes in elevation, differences in soil conditions, details of local hydrology, and other important changes in environment. This accomplishment is equivalent to irrigation canals built by prehistoric cultures in the American Southwest (Busch et al. 1976); for example, the Hohokam-Pima Irrigation sites that are part of Pueblo Grande Ruin and Irrigation Sites⁸ near Phoenix, Arizona are similar in size and cross-section and traverse many miles (Schroeder 1941; Woodbury 1960). Likewise, the canoe canals reflect similar architectural and engineering accomplishments as the raised causeways connecting some Maya sites in Mesoamerica (Coe 1987: 64, 104, 113-114; Sabloff 1989:212), or irrigation canals built by some coastal South American cultures (Moseley 1983:189-190, 234-235).

⁸ The Hohokam-Pima Irrigation Sites were designated a National Historic Landmark June 19, 1964.

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SUMMARY

The Mud Lake Canal is identified in the National Historic Landmark theme study *Southern Florida Sites Associated with the Tequesta and their Ancestors* as a nationally significant example of a long distance canoe canal associated with the Tequesta peoples in the Everglades of southern Florida and adjacent areas.

The property meets Criterion 4 because it is the best preserved example of a rare prehistoric engineering feat—a long-distance canoe canal. A significant amount of labor is involved in planning and constructing functioning canoe canals, as well as a detailed and complex understanding of local topographic and hydrologic conditions.

The property meets NHL Criterion 6 because it is a rare and well-preserved example of an aboriginal canoe canal, a type of site that is unique to Florida and the Southeast in terms of North American prehistory and archeology. Recent research has documented that the canal channel contains stratified deposits that can be radiocarbon dated. This is extremely significant in terms of future research on the cultural affiliation, function, use and age of aboriginal canoe canals in the southeastern United States.

The Mud Lake Canal is considered significant in terms of the NHL theme Peopling Places because archeological sites associated with the Tequesta and their ancestors provide the primary source of information on this group and are recognized as significant at the national level for several reasons, including their adaptation to and relationship with the Everglades, acknowledged as a unique hydrological and environmental system.

Expressing Cultural Values is an applicable theme because the canal is considered as an architectural feature—the melding of art and construction (National Park Service 1993). Research indicates that long-distance canoe canals have not been documented in other parts of the Southeast or in North America. The Mud Lake Canal and the other Florida canoe canals are different than other Indian-dug earthworks of the Southeast because they were designed for purposes of travel.

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The property is significant in terms of the theme Developing the American Economy since it may have figured prominently in seasonal movements of people between the Miami River/Biscayne Bay area and the upper Florida Keys (Griffin 1988:278) and because of its strategic location at a major crossroads that may have allowed the residents of the Bear Lake mound group to control traffic moving between the Ten Thousand Islands, upper Florida Keys, and Everglades (Wheeler 1998a). Further significance of the Mud Lake Canal under this theme is found in its direct and indirect relationship with aboriginal watercraft.

Finally, the Mud Lake Canal exemplifies the theme Expanding Science and Technology because research into the placement and size of the Mud Lake Canal reveals that, like other long-distance canoe canals, this feature was a major undertaking in terms of planning and construction (and possibly maintenance).

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Previous documentation on file (NPS):

- ☐ Preliminary Determination of Individual Listing (36 CFR 67) has been requested.
- ☒ Previously Listed in the National Register. A portion of the Mud Lake Canal was included in the Bear Lake Archeological District, listed in the NRHP November 11, 1996.
- ☐ Previously Determined Eligible by the National Register.
- ☐ Designated a National Historic Landmark.
- ☐ Recorded by Historic American Buildings Survey: #
- ☐ Recorded by Historic American Engineering Record: #

Primary Location of Additional Data:

- ☐ State Historic Preservation Office
- ☐ Other State Agency
- ☒ Federal Agency: Everglades National Park and the Southeast Archeological Center, National Park Service, Tallahassee
- ☐ Local Government
- ☒ University: Photographs can be found in the Department of Anthropology, Florida Atlantic University, Boca Raton, FL and at the Florida Museum of Natural History, Gainesville, FL (John M. Goggin Collection).
- ☒ Other (Specify Repository): No artifact collections are known from the Mud Lake Canal. Additional information can be found in the files of Ryan J. Wheeler, Tallahassee, FL.

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10. GEOGRAPHICAL DATA

Acreage of Property: 46.7 acres

UTM* References:	Ref. No.	Zone	Easting	Northing
	1	17	505566	2784585
	2	17	506010	2783992
	3	17	506370	2784237
	4	17	506604	2784106
	5	17	507157	2784305
	6	17	507642	2784077
	7	17	507847	2783729
	8	17	508378	2783073
	9	17	509085	2782263

*UTM coordinates based on NAD 83 datum.

Verbal Boundary Description

The Mud Lake Canal (8MO32) is located entirely within Everglades National Park. The boundary of the Mud Lake Canal includes the 6.3 kilometers (3.9 miles) canal bed and its associated banks, which have a maximum width of 30 meters (98.4 feet). The canal includes a total of at least 46.7 acres (18.9 hectares). The canal begins at the southwestern corner of Mud Lake, near where it joins Bear Lake; from its origin at the lake the canal can be followed to the southeast, then it turns sharply to the northeast passing near the Bear Lake Mounds. At the Bear Lake Mounds the canal turns again to the southeast, then again to the northeast; when it turns again to the southeast it crosses the distinctive coastal embayment. After crossing through the coastal embayment the canal tracks to the southeast until it reaches the coastal mangrove forest where it appears to merge with the numerous tidal creeks and drainages of the forest. The UTM reference points include the western (Ref. No. 1) and eastern (Ref. No. 9) ends of the canal, as well as major inflection points described above.

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Boundary Justification

The boundaries include all known and extant portions of the Mud Lake Canal (8MO32).

The 1996 National Register of Historic Places documentation of the Bear Lake Archeological District defines the boundaries of the district to include several mound and habitation sites (8MO33, 8MO34, and 8MO35) as well as a portion of the Mud Lake Canal (8MO32). That nomination focused on the mound features and their significance in the broader patterns of prehistoric habitation found in Everglades National Park. While these mound sites certainly are significant, this nomination was prepared to focus on the significance of the prehistoric canoe canal in terms of broader patterns of aquatic adaptation, transportation, exchange, and ancient engineering exhibited by the Tequesta and their ancestors.

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11. FORM PREPARED BY

Name/Title: Ryan J. Wheeler, Ph.D., State Archaeologist and Chief, Bureau of Archaeological Research

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Date: May 2005

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Washington, DC 20240

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NATIONAL HISTORIC LANDMARKS SURVEY
November 14, 2005

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Additional Documentation

Submit the following items with the completed form:

Continuation Sheets

Maps A USGS map (7.5 or 15 minute series) indicating the property's location.
A sketch map for historic districts and properties having large acreage or numerous resources.

Photographs Representative black and white photographs of the property.

Additional items (Check with the SHPO or FPO for any additional items)

Property Owner

(Complete this item at the request of the SHPO or FPO.)

Name: Everglades National Park/United States Department of the Interior

street & number: 40001 State Road 9336 telephone: (305) 242-7710

city or town: Homestead state: FL zip code: 33034

PHOTOGRAPHS

- 1 1) Mud Lake Canal (8MO32)
2) Everglades National Park, Monroe County, FL
3) Wm. Jerald Kennedy
4) 1965
5) Department of Anthropology, Florida Atlantic University, Boca Raton, FL
6) oblique aerial of Bear Lake site (8MO33) (distinguished by taller trees), the twentieth century Homestead Canal is visible curving to avoid the site; the aboriginal Mud Lake Canal (8MO32) is visible just in front of the Bear Lake mound and crossing to the southeast (lower right corner of photo), camera facing northeast
7) 1 of 7

Items 1-2 are the same for the remaining photographs

- 2 3) Wm. Jerald Kennedy
4) 1965
5) Department of Anthropology, Florida Atlantic University, Boca Raton, FL
6) oblique aerial photograph looking to the northwest directly down the course of the Mud Lake Canal (ca. 1965); the waters of Mud Lake and Coot Bay are faintly visible at the horizon, camera facing northwest
7) 2 of 7
- 3 3) United States Department of Agriculture

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- 4) March 1953
 - 5) United States Department of Agriculture, Washington, D.C.
 - 6) Enlarged portion of aerial photograph showing the Mud Lake Canal. Note the distinctive embayment, which is lighter gray in the photograph, that the canal passes through. This embayment separated the freshwater lakes and sloughs to the north from the brackish and salt waters of the mangrove forest and Florida Bay.
 - 7) 3 of 7
-
- 4 3) National High Altitude Photography Program
 - 4) March 1984
 - 5) United States Department of the Interior, Agricultural Stabilization and Conservation Service, Salt Lake City, UT
 - 6) Enlarged portion of aerial photograph 49-81 258009 showing the Mud Lake Canal.
 - 7) 4 of 7
-
- 5 3) John M. Goggin
 - 4) 1950
 - 5) Slide No. 197, Anthropology Department, Florida Museum of Natural History, Gainesville, FL
 - 6) Photograph of the Mud Lake Canal; note the whitened trunks of the red mangroves destroyed by the Labor Day hurricane of 1935.
 - 7) 5 of 7
-
- 6 3) Lawrence Will
 - 4) 1966
 - 5) Glades Historical Society, Belle Glade, FL
 - 6) view of the Mud Lake Canal, unknown camera direction
 - 7) 6 of 7
-
- 7 3) Ryan J. Wheeler
 - 4) February 1997
 - 5) Florida Division of Historical Resources, Tallahassee, FL
 - 6) view of Mud Lake Canal, south of the Homestead Canal, camera facing southeast
 - 7) 7 of 7

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TABLES

Table 1. Accelerator Mass Spectrometer (AMS) radiocarbon dates from the Cape Sable canals (from Beta Analytic, Inc. 2002 and Ferik 2003).

Site Name	Site No.	Lab#	Material	Measured Age	¹³ C/ ¹² C ratio	Conventional Radiocarbon Age	Calibrated Result (2 sigma)
Mud Lake Canal	8MO32	Beta 164980	organic material	660 +/- 40 B.P.	-26.9 o/oo	630 +/- 40 B.P.	660-540 B.P. (A.D. 1290-1410)
Snake Bight Canal	8MO29	Beta 164979	organic material	590 +/- 40 B.P.	-26.4 o/oo	570 +/- 40 B.P.	650-520 B.P. (A.D. 1300-1430)

Table 2. Comparative data for Florida aboriginal canals.

Canal	Length	Width, Canal Bed	Average Depth Below Ground	Associated Sites	Selected References
Walker's 8WL344	1.19 km (.74 mi)	3.0-3.7 m (10-12 ft)	1.8 m (6 ft)	8WL334	Walker 1883, 1884; Wheeler 1998b
Pine Island 8LL34	4.2 km (2.6 mi)	6-9 m (20-30 ft)	1-2 m (4-6 ft)	8LL33, 36, 37, 38, 39, 40, 783, 784	Douglass 1885; Cushing 1897; Luer 1989; Luer and Wheeler 1997, 2001
Ortona, east 8GL4A	3.2 km (2 mi)	5 m (15 ft)	1 m (3 ft)	8GL5, 8GL35	Goggin n.d.; Wheeler 1995
Ortona, west 8GL4B	3.7 km (2.3 mi)	5 m (15 ft)	1 m (3 ft)	8GL5, 8GL35	Griffin 1940; Goggin n.d.; Wheeler 1995
Naples 8CR59	1.26 km (0.79 mi)	3.7 m (11 ft)	1.2-2.4 m (4-8 ft)		Luer 1998
Mud Lake 8MO32	6.3 km (3.9 mi)	6-9 m (20-30 ft)	0.3-0.6 m (1-2 ft)	8MO30, 8MO33, and small middens	Small 1924, 1929; Wheeler 1998a
Snake Bight 8MO29	2.4-3.2 km (1.5-2.0 mi)	6 m (20 ft)	0.3-0.6 m (1-2 ft)	?	Goggin n.d.; Wheeler 1998a

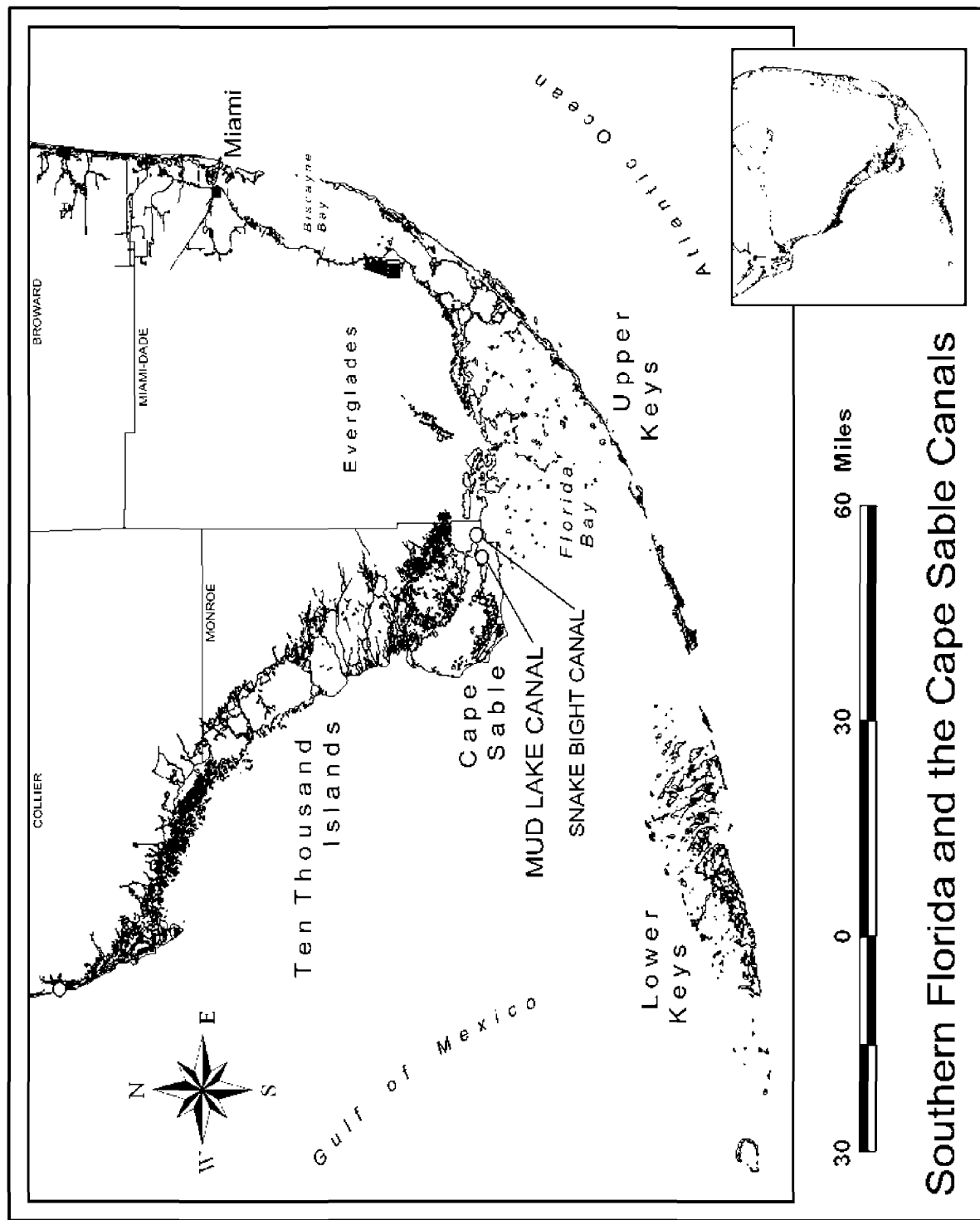


Figure 1. Locator map (after Wheeler 1998a:16).

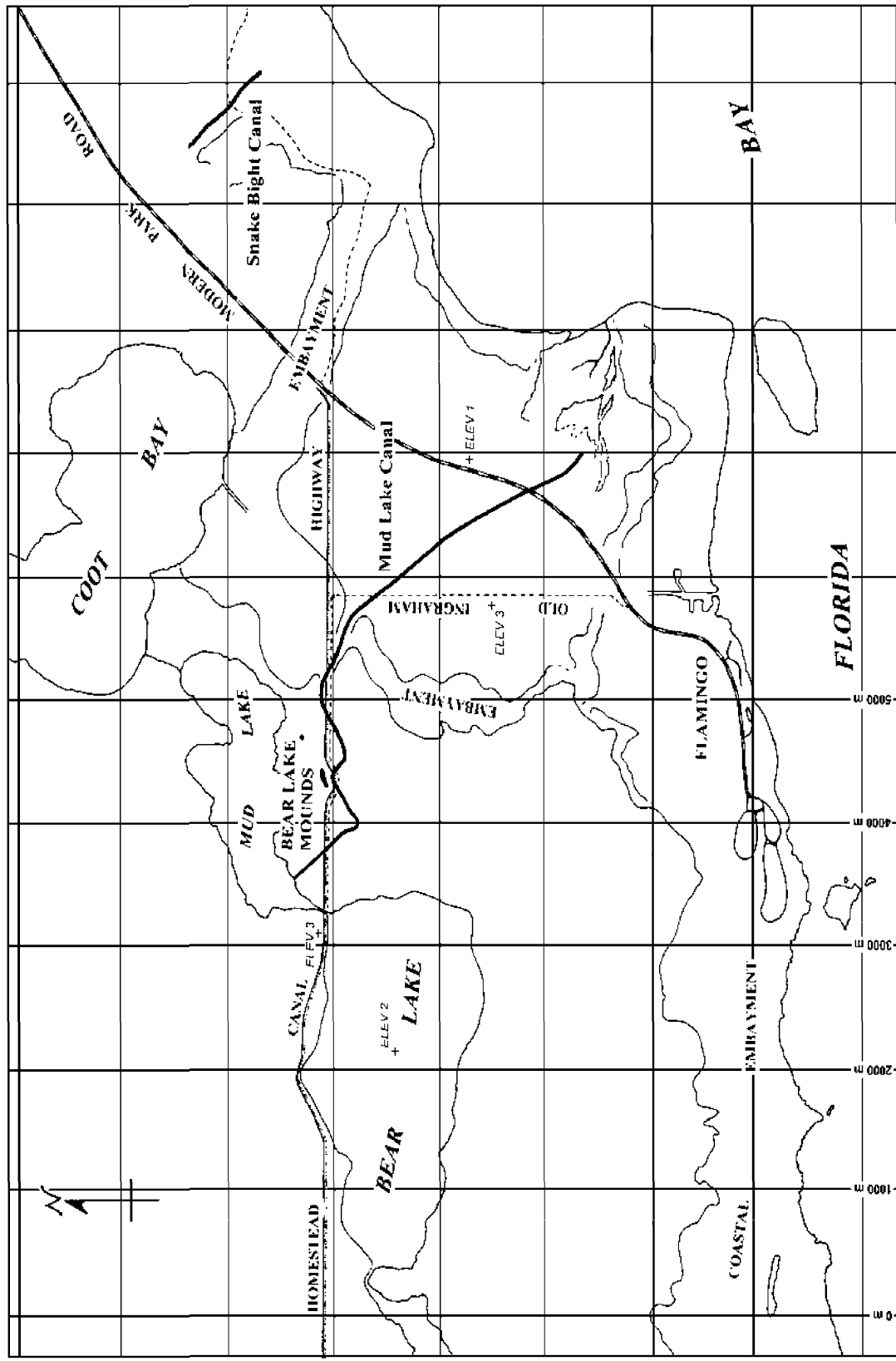


Figure 2. Map of Cape Sable region showing the Mud Lake Canal (8MO32), the Snake Bight Canal (8MO29) and the Bear Lake Mound Group (after Wheeler 1998a:17).

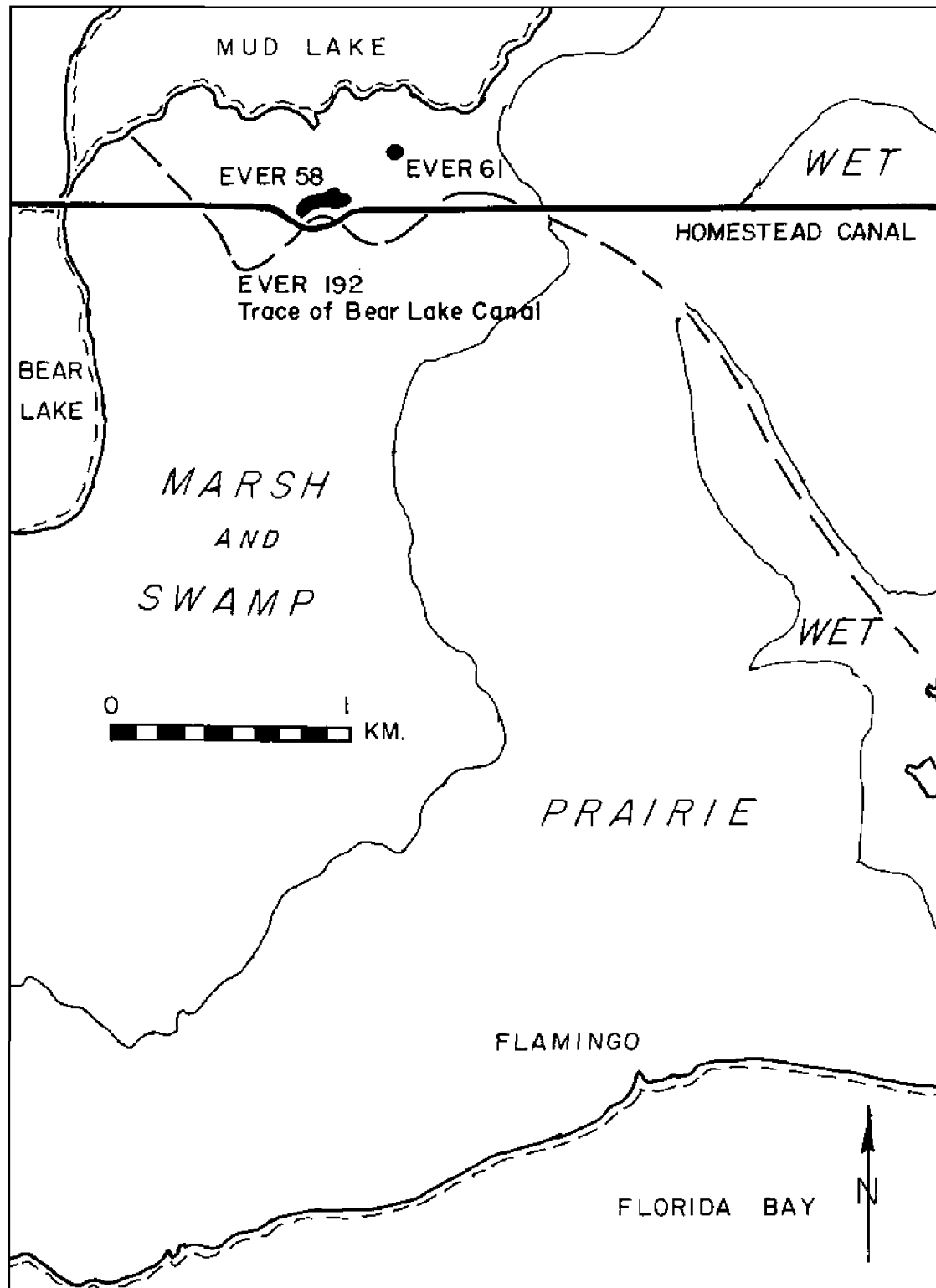


Figure 3. Map of the Mud Lake or "Bear Lake" Canal (after Griffin 1988:182).

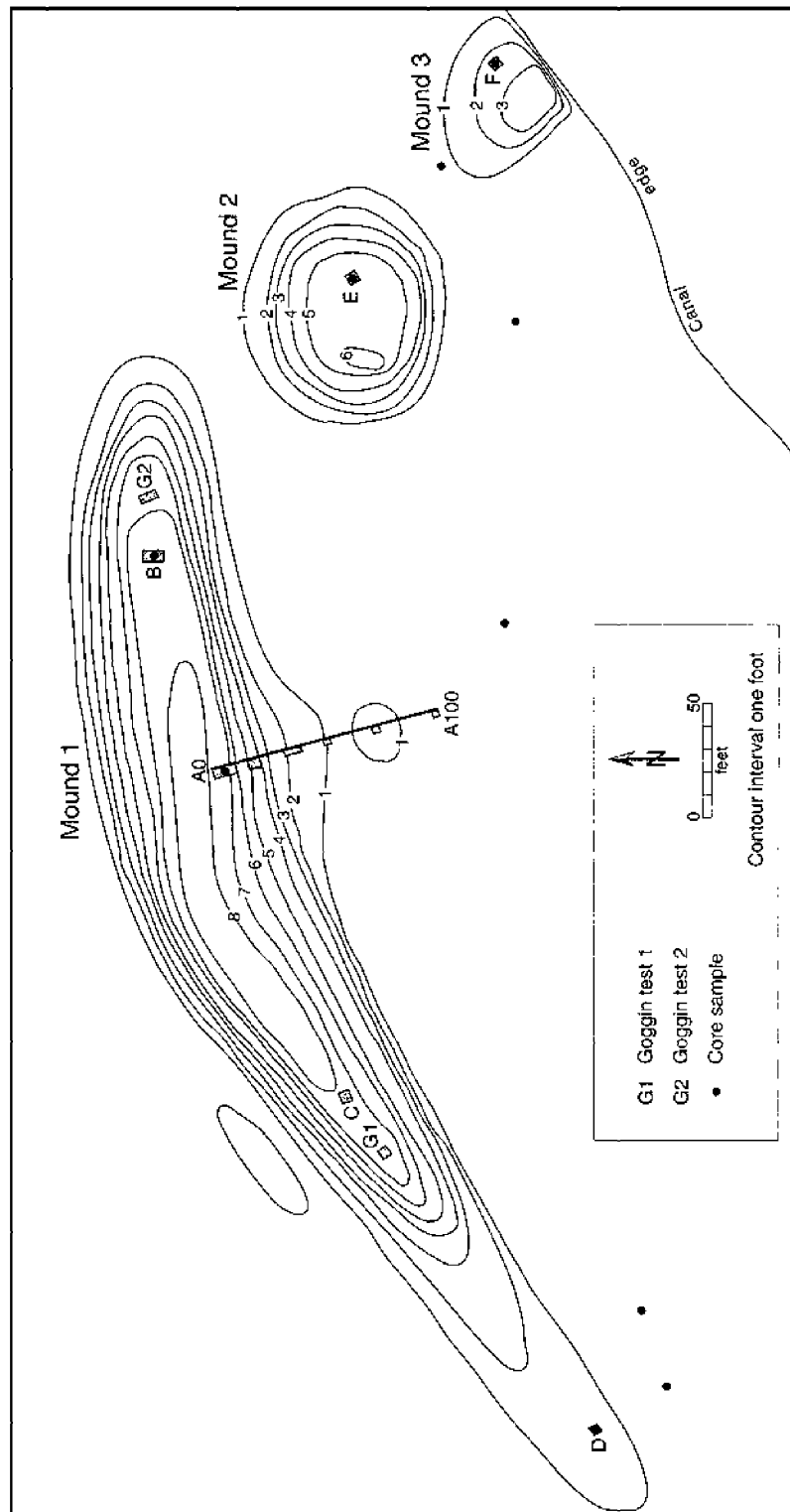


Figure 4. Map of the Bear Lake Mound group (after Griffin 2002:191). Note that the canal shown in the lower right is the twentieth century Homestead Canal and not the prehistoric Mud Lake Canal.

Prehistoric Canoe Canals of Cape Sable in relation to Archeological Sites of southern Florida

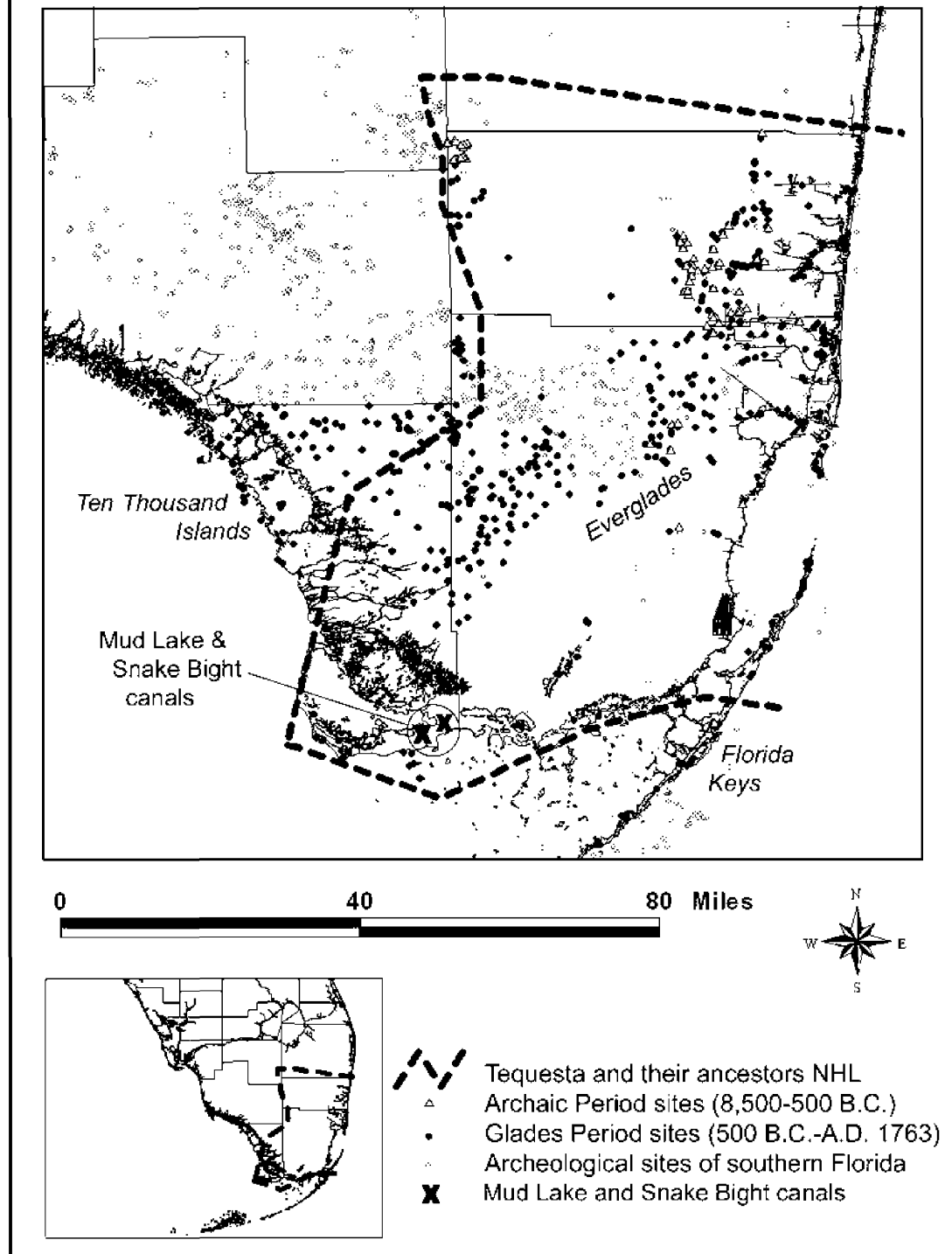


Figure 5. The Mud Lake Canal in relation to the archeological sites of southern Florida.

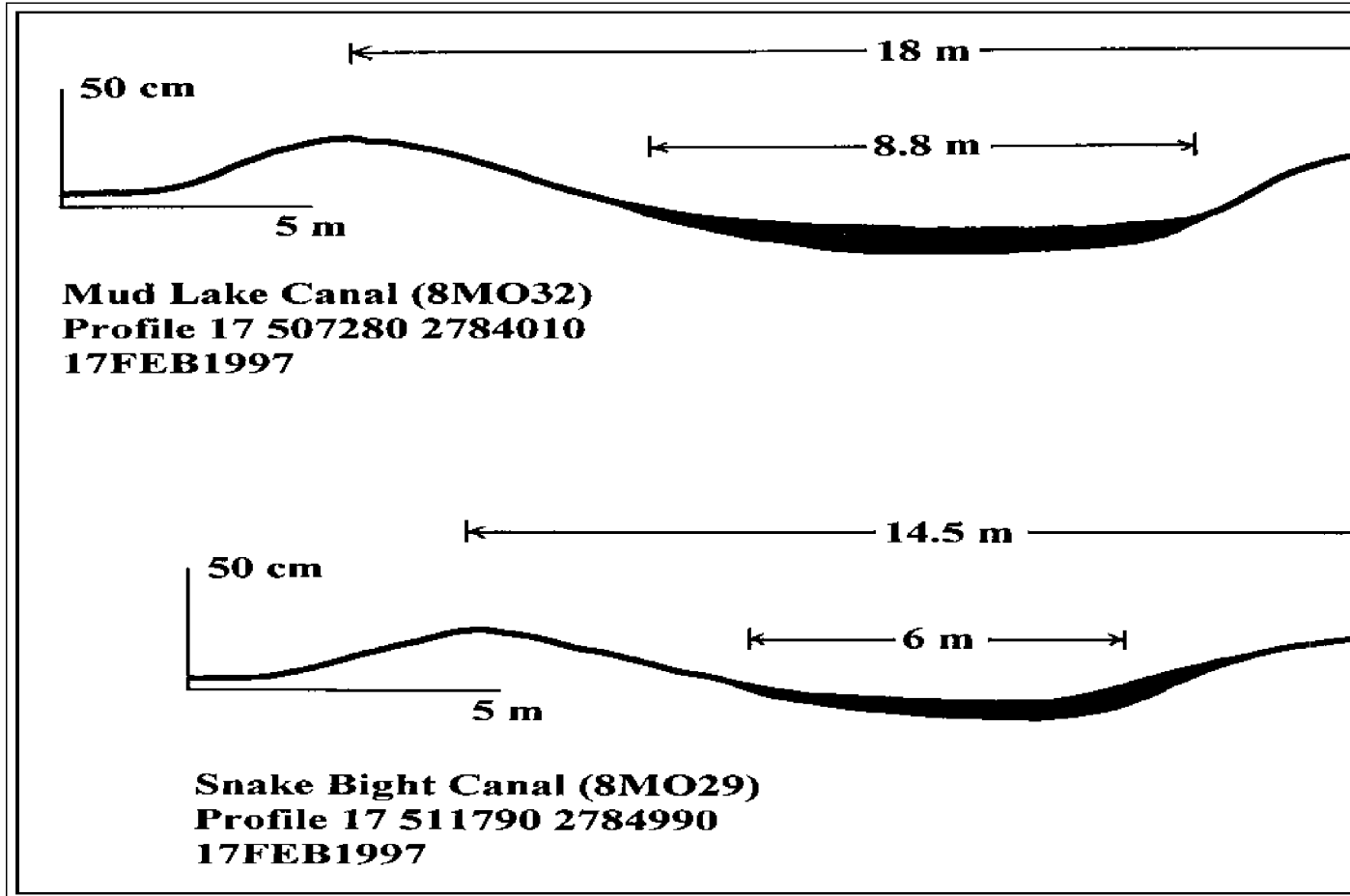


Figure 6. Cross-section profiles of the Cape Sable canals (vertical scale exaggerated) made in 1997: a) Mud Lake Canal (8MO32); b) Snake Bight Canal (8MO29) (after Wheeler 1998a:23).

Mud Lake Canal West Profile

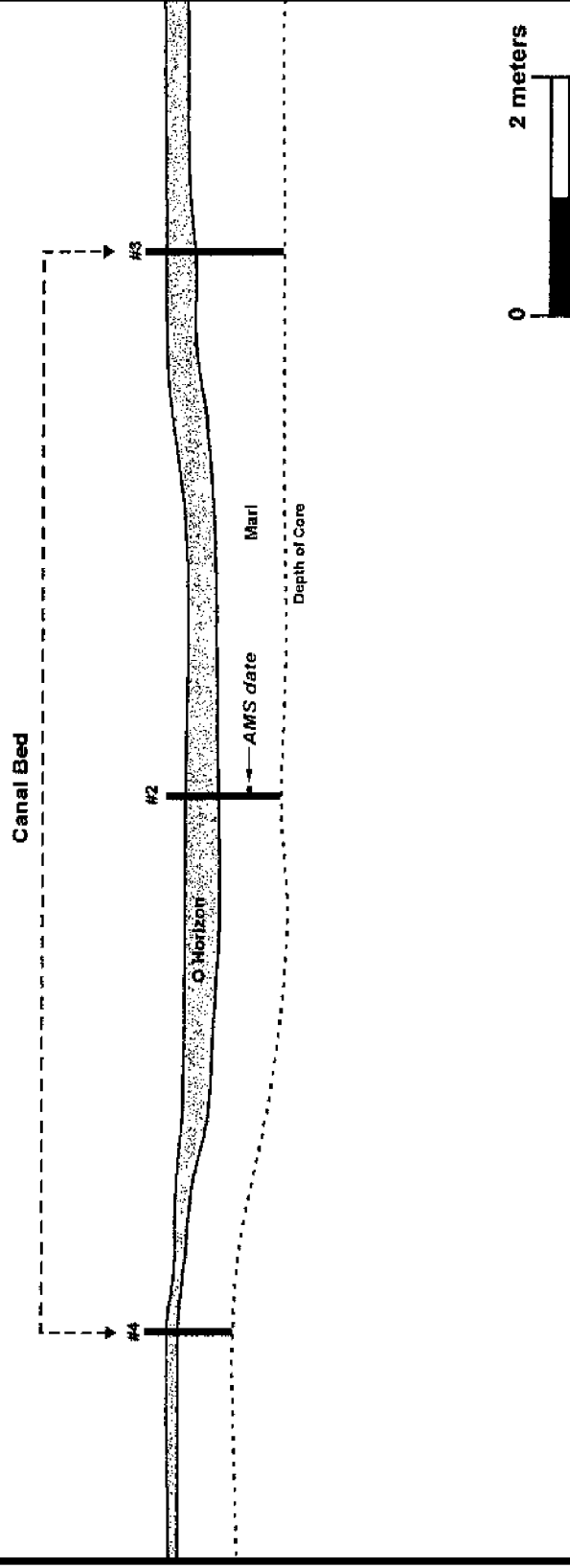


Figure 7. Cross-section profile of the Mud Lake Canal showing core and AMS radiocarbon date locations (after Ferik 2003:52).

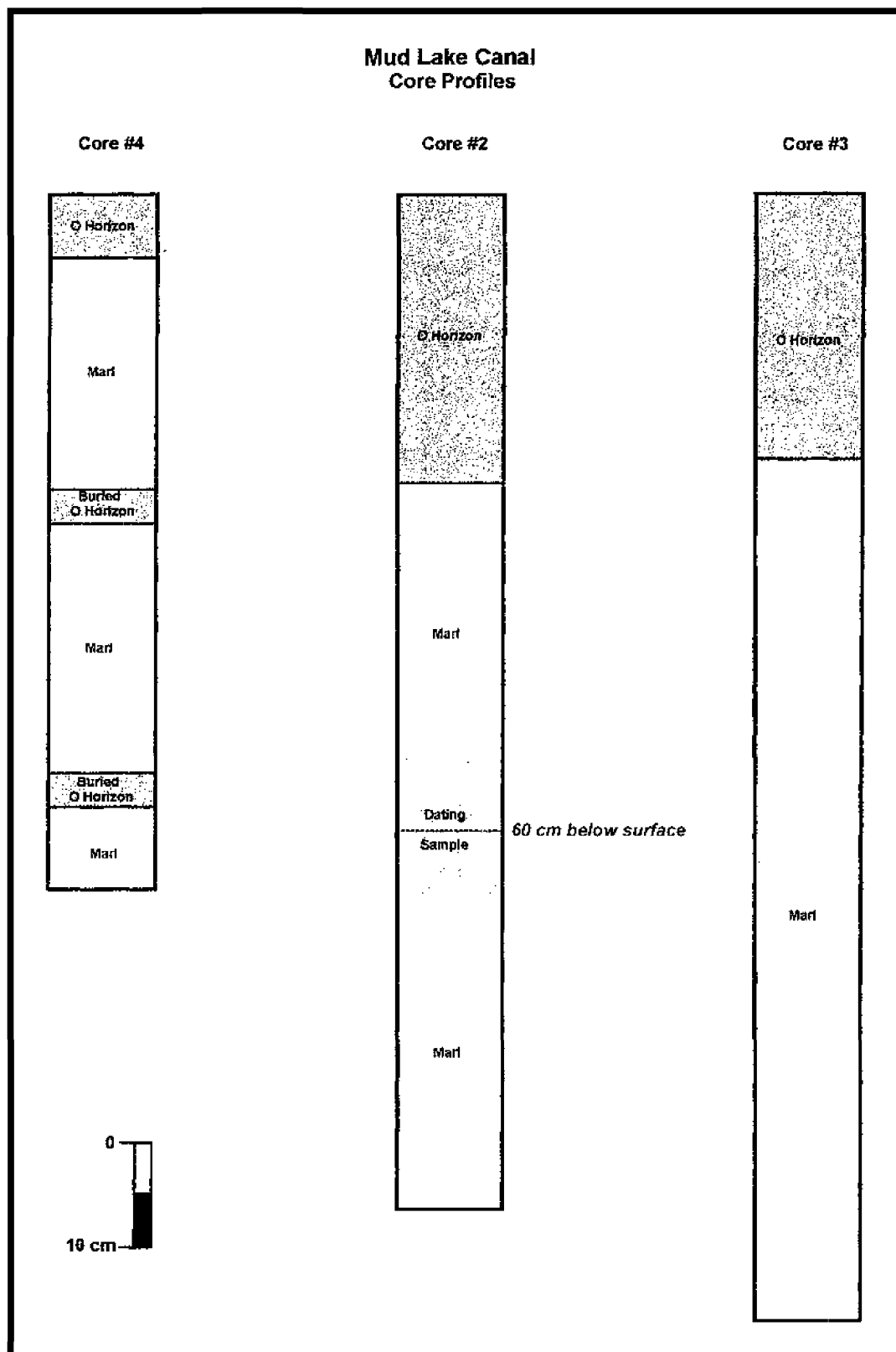


Figure 8. Core profiles from the Mud Lake Canal (after Ferik 2003:55).

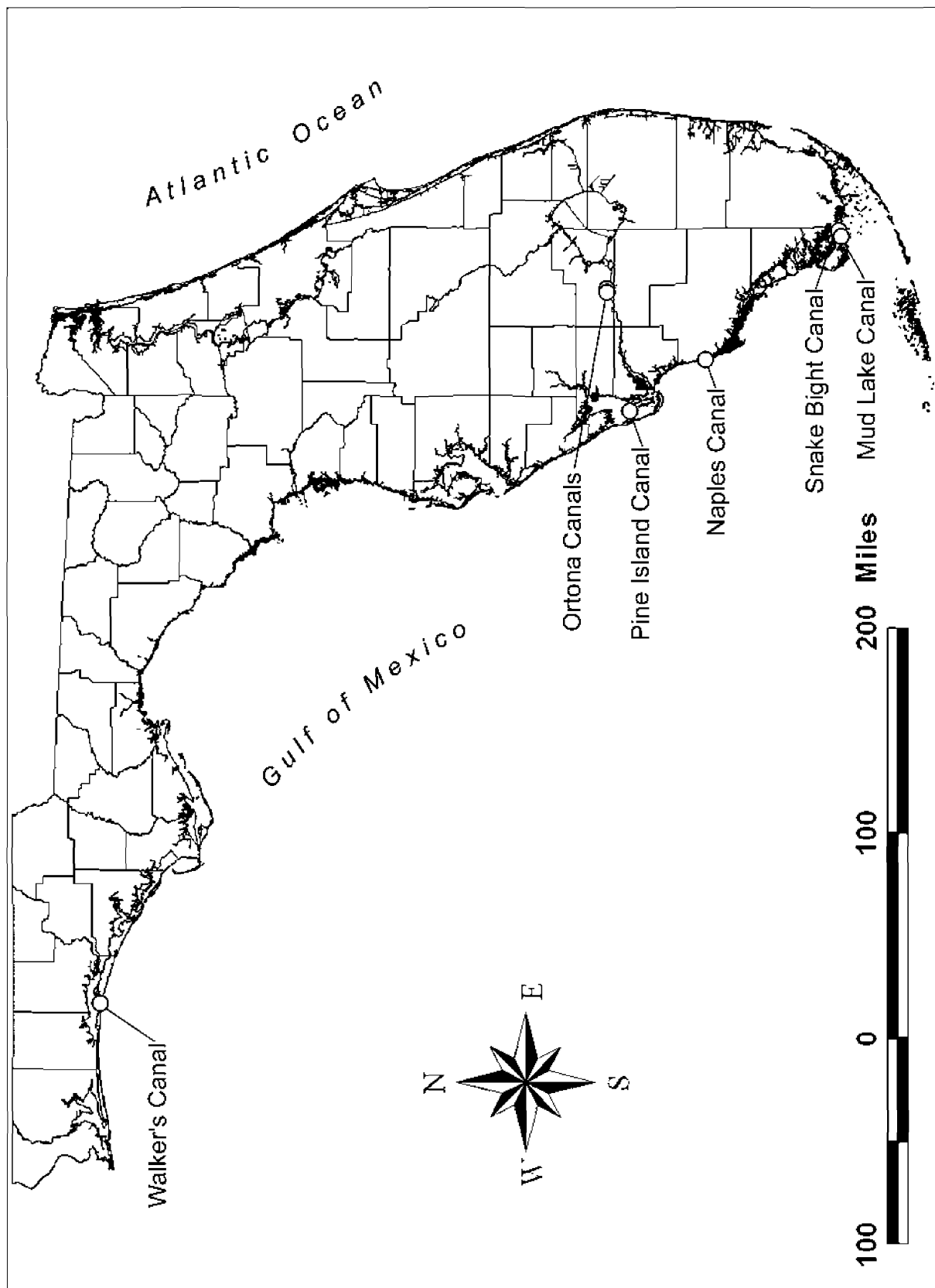
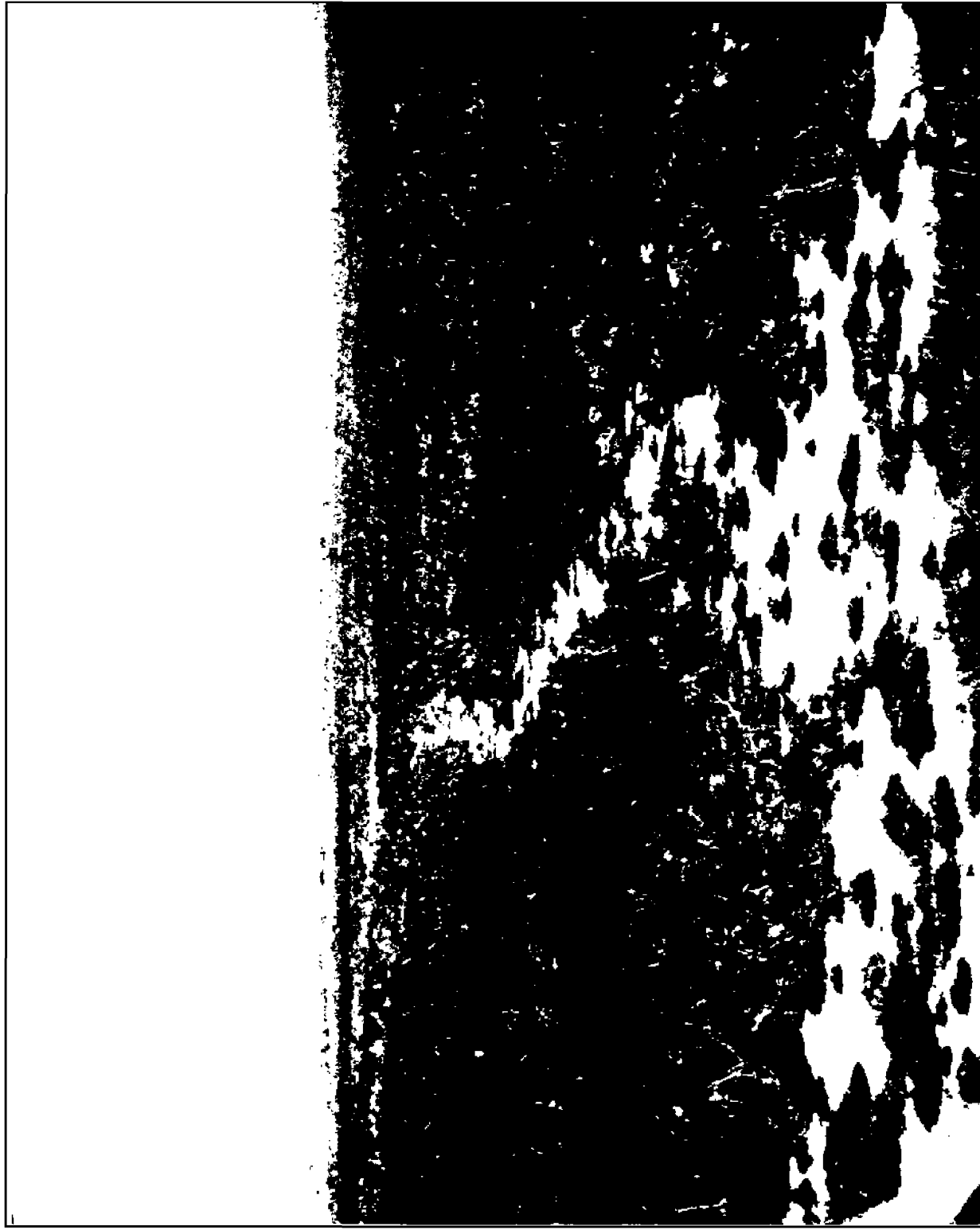


Figure 9. Map showing Florida canoe canals.



Photograph 1 of 7. Oblique aerial of Bear Lake site (8MO33) (distinguished by taller trees), the twentieth century Homestead Canal is visible curving to avoid the site; the aboriginal Mud Lake Canal (8MO32) is visible just in front of the Bear Lake mound and crossing to the southeast (lower right corner of photo), camera facing northeast.



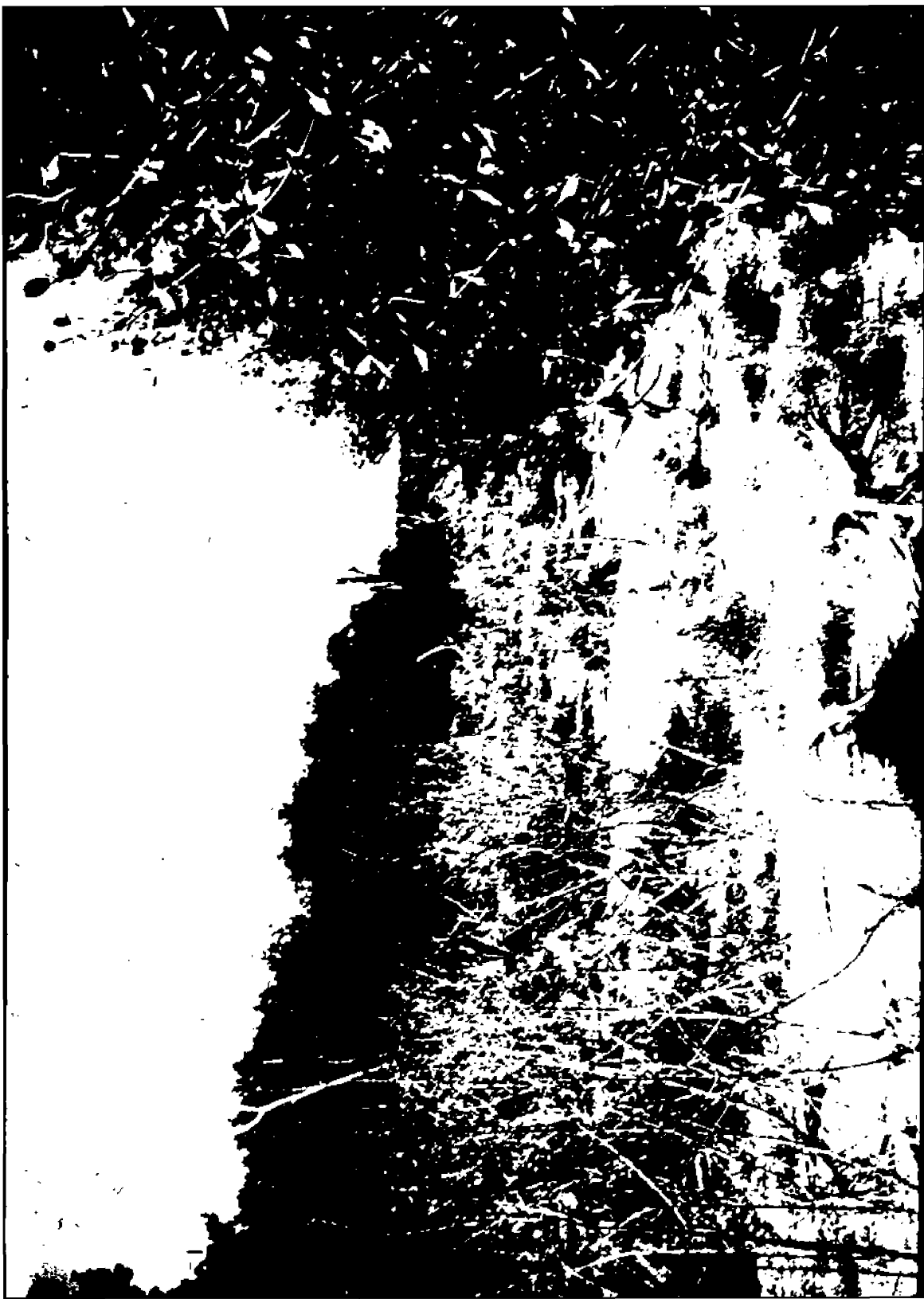
Photograph 2 of 7. Oblique aerial photograph looking to the northwest directly down the course of the Mud Lake Canal (ca. 1965); the waters of Mud Lake and Coot Bay are faintly visible at the horizon, camera facing northwest.



Photograph 3 of 7. Enlarged portion of a 1953 aerial photograph showing the Mud Lake Canal. Note the distinctive embayment, which is lighter gray in the photograph, which the canal passes through. This embayment separated the freshwater lakes and sloughs to the north from the brackish and salt waters of the mangrove forest and Florida Bay. White arrows point to the canal.



Photograph 4 of 7. Enlarged portion of a 1984 aerial photograph (no. 49-81 258009) showing the Mud Lake Canal. White arrows point to the canal.



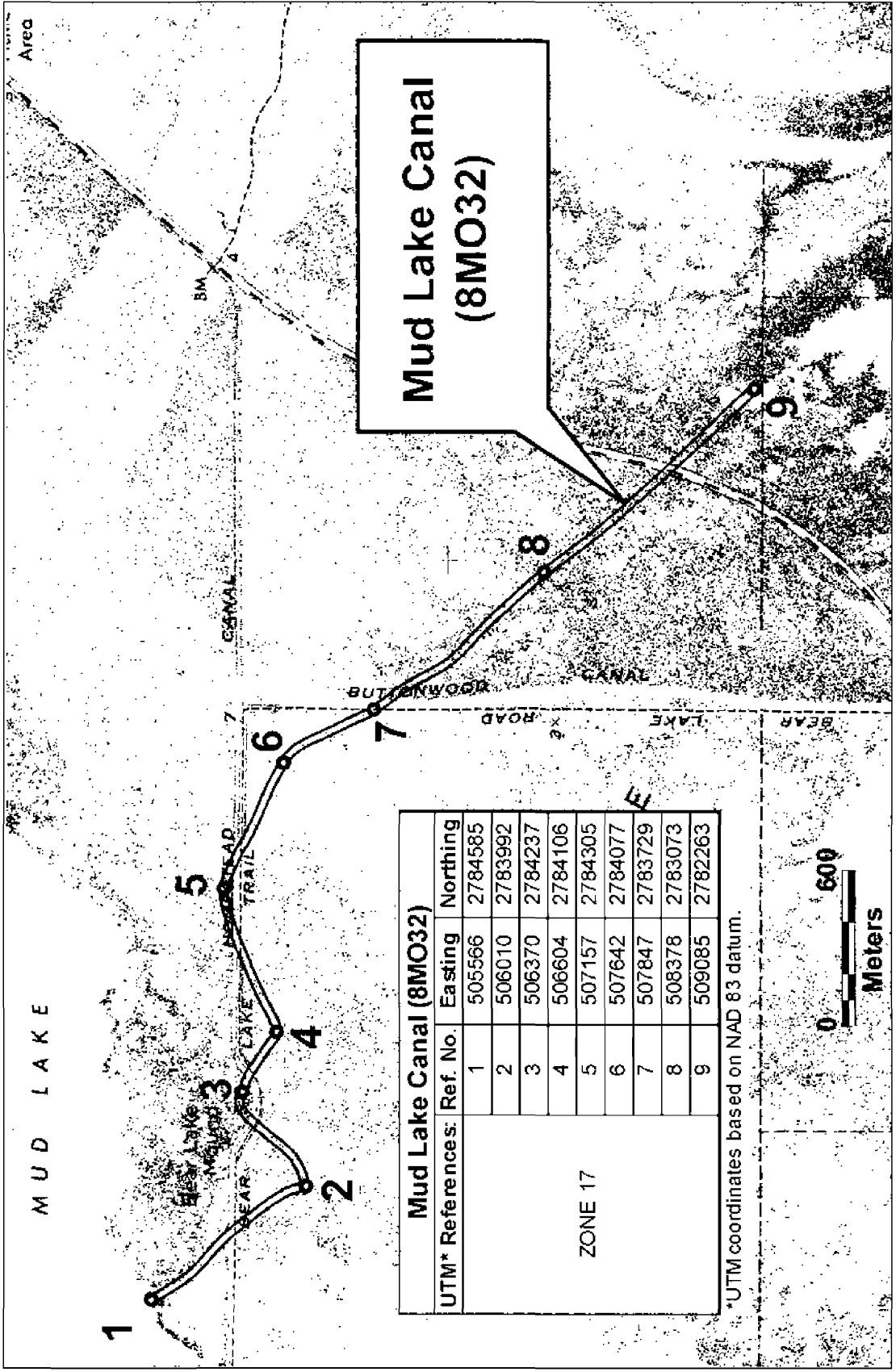
Photograph 5 of 7. Archeologist John M. Goggin's 1950 photograph of the Mud Lake Canal; note the whitened trunks of the red mangroves destroyed by the Labor Day hurricane of 1935.



Photograph 6 of 7. Historian Lawrence Will's 1966 view of the Mud Lake Canal, unknown camera direction.



Photograph 7 of 7. 1997 view of Mud Lake Canal, south of the Homestead Canal, camera facing southeast.



Mud Lake Canal (8MO32)			
UTM* References:	Ref. No.	Easting	Northing
ZONE 17	1	505566	2784585
	2	506010	2783992
	3	506370	2784237
	4	506604	2784106
	5	507157	2784305
	6	507642	2784077
	7	507847	2783729
	8	508378	2783073
	9	509085	2782263

*UTM coordinates based on NAD 83 datum.